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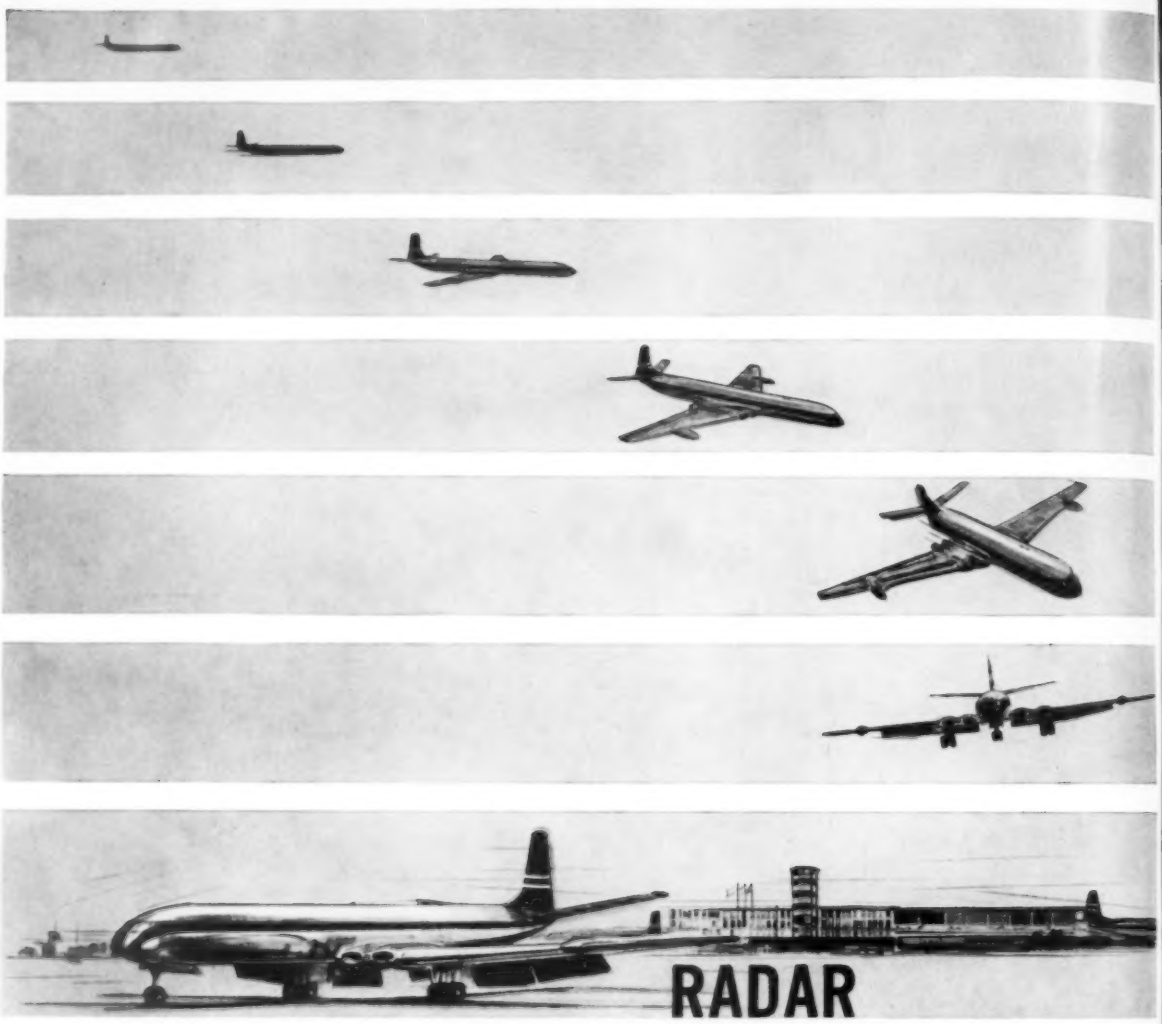

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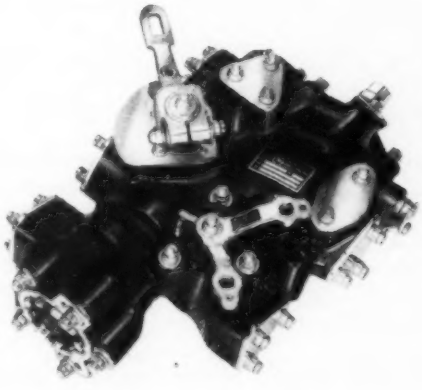

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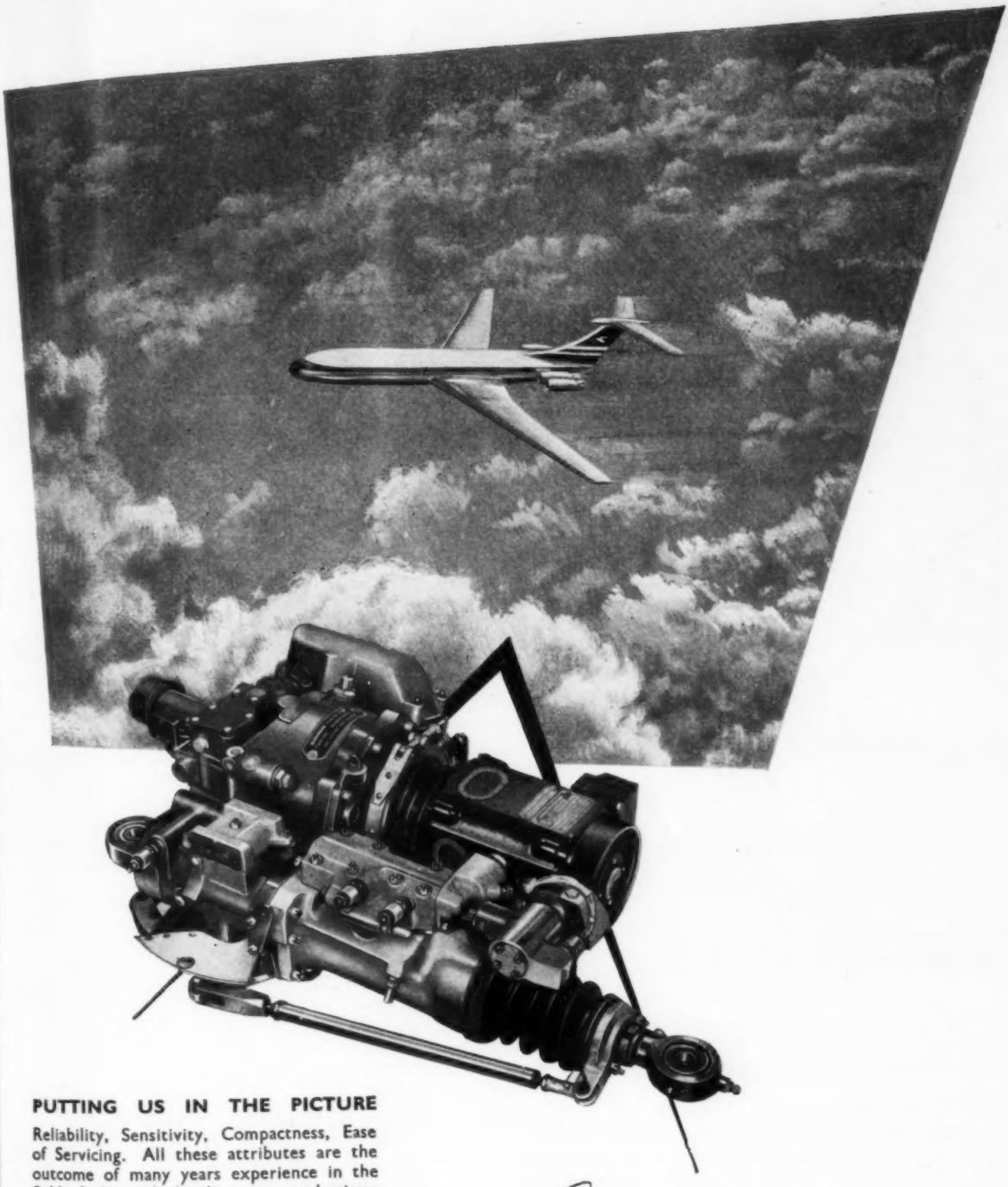

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No 2754 VOLUME 80 HURSDAY 21 DECEMBER 1961

FLIGHT

Official Organ of the Royal Aero Club First Aeronautical Weekly in the World Founded in 1909

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Industry and Government

REPRESENTATIONS by British aircraft constructors to the Ministry of Aviation have provided extensive Fleet Street copy in recent days. "Aircraft firms ask for backing" reads one headline. Another raises the temperature by declaring that aircraft builders are "angry over lack of orders." A third sends the thermometer to the limit by apprising its readers that aircraft manufacturers have given "revolt warnings."

These new manifestations of the grave uneasiness now felt by the industry about its future follow recent utterances which have not commanded such prominence in the national Press. Notable among these were those by Sir Roy Dobson at the Boscombe Down dinner last month. Sir Roy stressed that some companies' financial commitments are far bigger than they should be asked to carry without support; that foreign customers might ask for five, six or even ten years' credit; and that the lead that the British aircraft industry had established could not be maintained without assistance. The Government should be persuaded, he said, to tell the industry what it wanted seven or more years ahead.

Lack of development projects in particular is causing anxiety, linked with a sense of frustration occasioned by laggard decision-making and by the growing realization that British Service requirements might approximate more closely to those of NATO. These feelings are heightened by the consideration that the industry has played its part—or has gone far towards doing so—in amalgamating, but that the Government has failed in its forward planning to the extent that employment is dangerously threatened. In particular it is feared that valuable design teams may have to be dispersed.

The true extent of Government culpability for this worrying situation will no doubt emerge as the new year unfolds. Meanwhile, the industry is seeking to help itself by continuing heavy expenditure of its own money and by bold and imaginative—indeed now quite bewildering—industrial alliances with other countries. The newest of these, the agreement between de Havilland Aircraft of Canada, Bell Aerosystems of the USA, Avions Fairey of Belgium, and Nord Aviation of France, for collaboration in a NATO design competition for a V/STOL transport aircraft, is one which would have seemed truly fantastic even a year ago.

It must be added that the industrial and political considerations implicit in present planning are rendered the more difficult by technical problems which may not prove as tractable as was formerly hoped. Thus, the whole concept of supersonic airliner design could be changed by the growing recognition that the supersonic bang may dictate a basically new approach. Here the challenging and promising principle of variable geometry could come into its own.

These are serious thoughts for the festive season: but every new year should be filled with hope, buttressed by effort and resolve. In this regard the British aircraft industry has no reason to be daunted.

★ "Flight" wishes its readers a Merry Christmas and a Bright New Year

FROM ALL QUARTERS

FIRST TWO OF SIX Westland Gnome-Whirlwinds for the Ghana Air Force were handed over at Yeovil on December 14 by Mr E. C. Wheeldon (deputy chairman and managing director) to Mr K. Addae, Head of Chancery at the Ghana High Commission in London. As announced last March, the first aircraft is fitted out as a VIP version, while the others will have standard equipment and be easily adaptable for civil, ambulance or rescue duties

Hawker NBMR-4 Entry

ON December 15 Hawker Siddeley Aviation made the following announcement:

"An agreement has been signed between Hawker Siddeley Aviation, de Havilland Aircraft of Canada, Bell Aerosystems of USA, Avions Fairey of Belgium, and Nord Aviation of France for collaboration in the NATO design competition for a V/STOL transport aircraft. This alliance embraces a wide and varied experience in the design, development and production of military and civil transports, in the pioneering of VTOL and STOL aircraft, and in international co-operation in the field of production."

No details are given of what design(s) the consortium will enter, but the announcement seems to complete the line-up of major contestants in NBMR-4. Further comment is made in the leading article on the preceding page.

RAF Heralds?

DETAILS of the special Military Herald were given in *Flight* of December 7. The Minister of Aviation is said to have agreed that the RAF have established a need for "about 45" such aircraft; but—it is said—he cannot place an order without offending HSA and BAC, whose present establishment was largely brought about on the understanding that one or other would receive all future Government orders for large fixed-wing aircraft. Sir Frederick Handley Page is reported willing to join either group, but justifiably to resist doing so at an artificially depressed price.

Mirage III-V

SNECMA announce that the production version of this VTOL development of the Mirage III will be powered by a TF-106 turbofan with reheat in both the cold and hot ducts. This engine, first details of which were reported in *Flight* of June 1 of this year, is derived from the Pratt & Whitney JTF-10 under the terms of the agreement of December 1959. Although the basic TF-106 design is American, SNECMA are "adapting it to supersonic speeds," and are particularly engaged in the development of the reheat systems which should raise the thrust from 11,000 to at least 18,000lb (rather less than had originally been claimed).

Initial VTOL problems will be investigated with a converted Mirage III, lifted by eight Rolls-Royce RB.108s and propelled by a Bristol Siddeley Orpheus at speeds up to about 450kt. This aircraft may fly next June. Late in 1962 Dassault hope to fly the production version with a substantially increased size and weight and RB.162 lift engines as well as the TF-106. Named Balzac, it is an important entry in the NATO BMR-3 competition (*Flight*, November 30), in partnership with British Aircraft Corporation, who are also seeking a UK order for it.

Saab 401

THIS is the designation of an experimental hovercraft ordered by the Royal Swedish Navy in co-operation with other services for tests over land, water and ice. Powered by a 180 h.p. Lycoming, the 401 is designed for a crew of two but can carry greater loads. It has been preceded by many earlier projects and extensive laboratory testing, and is regarded as a stepping-stone to later ground-effect vehicles. The essentially rectangular-planform curtain is fed from a single eight-bladed fan, and several controllable ports are employed for propulsion and control. Gross weight will be some 3,000lb and the design speed is 50kt. The first 401 is now being built in the Saab helicopter factory at Norrköping, for delivery at the end of 1962.

P.1127 Destroyed

ON the morning of December 14 the second prototype Hawker P.1127 was totally destroyed after the company's chief test pilot Mr A. W. "Bill" Bedford had ejected at low altitude. While the first aircraft (XP831) has conducted the VTOL and hovering trials, the second machine (XP836) has been used for investigation of behaviour at high speeds as a conventional aeroplane. There is not at present any reason to believe that the loss of the aircraft was due to the fact that it is a VTOL type.

Accompanied by his colleague Hugh Merewether in the Hunter T.7 "chase plane," Bill Bedford was flying XP836 from Dunsfold in fully conventional configuration, with the four nozzles of the Bristol Siddeley Pegasus engine locked in the horizontal position and the bleed-air "puffer jets" (used for hovering control) inoperative. After throttling back from a high-speed run he encountered an aircraft oscillation of such a nature that he at first associated it with powerplant surge, but there is no evidence to suggest that this was occurring—nor, in fact, that the rough ride was connected with the engine at all. With the engine shut down, an attempt was made to land at RNAS Yeovilton, Somerset, but control of the aircraft is said to have become progressively more impossible—especially in the rolling plane—and Mr Bedford finally ejected at a height of 200ft.

The ejection seat was a Martin-Baker Mk 4HNS (a modified Mk 4, which is, of course, capable of operating at ground level) and its occupant landed in a field with only minor abrasions. The P.1127 ploughed through a Dutch barn and was completely demolished. A helicopter picked Mr Bedford up and, after lunching in the RNAS wardroom, he returned with Mr Merewether in the Hunter to Dunsfold and fulfilled an engagement at Farnborough on the same evening.

Delay in the P.1127 programme is not likely to be serious. The third aircraft is due to fly next month, and three more development machines are in advanced stages of construction at Kingston.

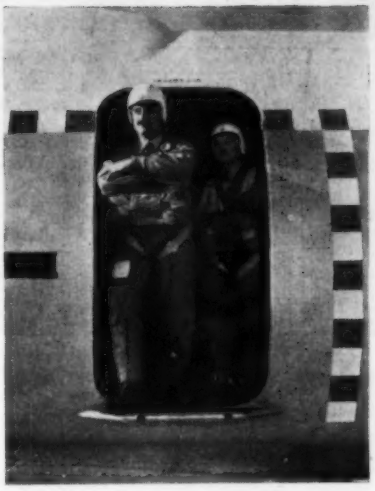
The ejection was the 506th successful emergency escape using M-B seats; and it was the 101st this year, of which half have involved US Navy aircraft. The first P.1127 has a "zero height, zero speed" seat for use while hovering. Later P.1127s will be the first aircraft to be fitted with the rocket seat demonstrated during the SBAC display last September.

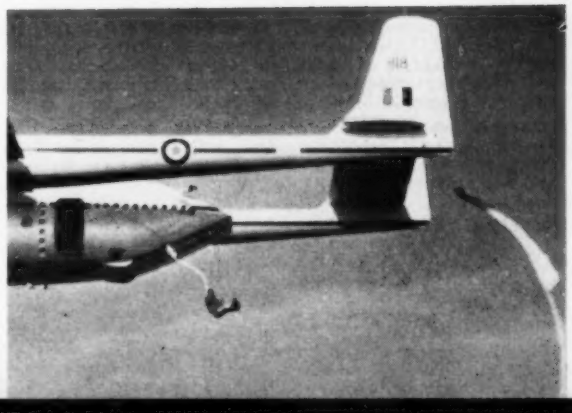
Tropical Trials Wessex

A WESSEX from A&AEE Boscombe Down, XM330, recently returned to the United Kingdom after successfully completing an intensive tropical trials programme. It had gone first to the French Air Force base at Le Bourget du Lac on the Swiss-French border and during 15 days there carried out trials, including VTO performance, hovering flight and handling at altitude. It then flew in two stages to Hal Far in Malta, where it was put through intensive day and night trials covering all aspects of its anti-submarine role. Final stage of the programme was undertaken at Idris, Libya, where the Wessex lifted and carried external loads of between 2,000 and 3,000lb in the high temperature of a North African summer. The machine was flown back to Boscombe Down after completing 127 hours' flying since its departure. During this time the automatic pilot was operating for 126hr and only one starting failure, due to a faulty cartridge, was recorded.

LOCKHEED EXECUTIVES.—Mr T. R. May (left) and Mr P. A. Colman (second from left)—recently visited Short Brothers & Harland's Belfast works, and are here seen inspecting an assembly model of the SC.5. With them are Mr Denis Tayler (right), chief test pilot, and Mr B. Penney, general works manager. Incidentally, Lockheed and Short are co-operating on the VTOL F-104G project, a NATO BMR-3 entry

ARGOSY EXIT: As briefly recorded on this page last week, the first live drops from an Armstrong Whitworth Argosy C.1 were made recently by three parachute instructors of RAF (Airborne Forces), Boscombe Down. Here two of them—Flt Lt B. W. Rigold (left) and Flt Sgt B. Lambirth—are seen in readiness to jump, while the sequence of pictures below shows how the deploying canopies clear the tail, with the static lines and bags moving up above the door, well out of the next man's way





Westland Financial Year

PROFITS of Westland Aircraft before taxation, for the year ended September 30, were £2,781,837. This compares with £2,583,255 for the previous year—a figure which included profits of Fairey Aviation and the Bristol helicopter division, acquired in 1960, for nine months. Net group profit this year after taxation is £1,384,389, as against £1,330,861 for the previous year.

1961-62 Jane's

NOW published (by Sampson Low, Marston, at £5 5s), the first edition of *Jane's All the World's Aircraft* to have been compiled and edited entirely by John W. R. Taylor breaks new ground in a number of important respects. Standardization of 7pt type makes the volume notably compact, and every column-inch is used to advantage. A welcome change is that all countries are now in true alphabetical order, and three of the most important are now listed as "UK," "USA," and "USSR." Target drones and other pilotless aircraft now have a section to themselves, as do what Mr Taylor calls "air cushion vehicles." Dennis Punnett, well known to readers of *Flight*, is progressively introducing three-view drawings to a standard style, and the general standard of accuracy and presentation is even higher than that of previous volumes. Jane's will never be rivalled.

IN BRIEF

The second Internation Light Aviation Show is being held next year at Cannes-Mandelieu airfield from May 30 to June 11.

It was recently reported in the *Rand Daily Mail* that South Africa had ordered 16 Dassault Mirages and had taken an option for 16 more.

Mr G. E. P. Checketts of Bristol Aircraft has been appointed personnel manager of Hunting Aircraft.

What is described as a "substantial contract" has been placed with the Dowty Group by Hindustan Aircraft for equipment for the HF-24. No details of the equipment, nor of the size of the contract, have been given.

King Hussein of Jordan visited RAF Wattisham last Friday. He was received by the AOC-in-C Fighter Command, Air Marshal Sir Hector McGregor, "scrambled" the Wattisham wing of Lightnings and Javelins, watched a flying display and was given air experience in a Javelin T.3.

AVM F. Headlam, CBE, of the Royal Australian Air Force, is to become AOC No 224 Group, Far East Air Force on July 14 next year in succession to AVM R. A. Ramsay Rae, OBE, who has held the appointment since June 1959 and is retiring from the Service. AVM Headlam has been AOC Operation Command, RAAF, since May.

Pratt & Whitney Aircraft announce that the JT8D-1 turbofan has completed more than 1,000hr running and successfully completed its first 150hr test. During the latter the periods at take-off rating were made under simulated hot-day conditions, and at no time was there a shut-down due to engine causes. Powerplant of the Boeing 727, the JT8D-1 was described in *Flight* for June 29.

The PD-808, the light utility jet transport to be produced jointly by Douglas Aircraft and Piaggio, has been named Vespa-Jet. Vespa, meaning "wasp," is the trade name of the motor scooter produced by Piaggio. Available in 1963, the Vespa-Jet will cruise at speeds of up to 500 m.p.h. It is to be powered by General Electric CJ-610 or Bristol Siddeley Viper 20 engines.

The US Navy have filed claims to new aeroplane and helicopter world records. A Sikorsky HSS-2 from Patuxent River was on December 1 flown over a closed course off the Connecticut shore at 175.3 m.p.h. for 1,000km, 179.5 m.p.h. for 500km and 182.8 m.p.h. for 100km. On December 6 a McDonnell F4H-1 Phantom II, from Edwards AFB, sustained level flight at 66,443.8ft (12.58 miles). The only previous record submitted under the new FAI rules was 55,300.95ft, by Miss Jacqueline Cochran, on November 12. (Other aircraft have flown much higher under the old rules; 70,310ft has been sustained by a Canberra.)

Chance Vought are converting an early F8U-1 Crusader into a tandem-seat trainer designated F8U-1T. At present not the subject of a Navy contract, the new version is scheduled to fly in February, and said to meet a need for a carrier-based trainer capable of operating up to M1.5 at over 50,000ft. Changes are restricted to the forward fuselage. The rear cockpit is fully equipped with controls, communications, navigation and radar equipment, and its occupant can see ahead over the pilot in the existing cockpit. Two of the four 20mm guns and the rocket pack are deleted, but provision is made for two Sidewinder missiles and a braking parachute. The new F8U-2NE radar and a Chance Vought-designed autopilot will be installed.

Safety, Economy, Comfort

IN AIR TRANSPORT

LORD DOUGLAS interviewed by FRANK BESWICK

THIS is the third in a special series of interviews in which Frank Beswick is seeking authoritative opinions on these three vital factors in air transport. In the November 30 issue he recorded Sir Frederick Handley Page's views, and last week those of Lord Brabazon of Tara. Here he talks with Lord Douglas of Kirtleside, British European Airways' chairman.

NATURALLY it was necessary to get the opinions of an operator on these matters of safety, economy and comfort in air transport, and it is impossible to think of a more sturdy spokesman for the industry than Marshal of the Royal Air Force Lord Douglas of Kirtleside. Through all the changes of British civil aviation he has continued to watch over the affairs of BEA.

Maybe his greatest single contribution to BEA's success was the sense of confidence which he engendered in a much-troubled organization in an unstable industry. Readers will see, from the answers below, that there still runs the same steady confidence in the field for which he is responsible. And, as always, Lord Douglas can point to the record as justification for his judgments.

Apart from any general consideration of the possibility of safer machines for air transport [I asked], do you think that the public concern over safety, stimulated by recent accidents, is justified?

The scheduled services of British airlines are safer today than they have ever been. The public concern you mention is a result of recent accidents to charter services. BEA's safety record is very good.

Do you think there is any one feature of the series of crashes which merits special attention?

If you want a feature, then the fact that there have been quite so many is important. The trouble may partly be due to the fact that on a scheduled route the pilot must have adequate route experience, and that does not apply in the same way to charter operations. For this reason, BEA now spends about a million pounds a year on training.

You think the present requirement in the Air Navigation Order about the pilots' knowledge of route characteristics is not enough?

I think there is all the difference between studying these things in *Air Pilot* and actually going down the route to see for yourself.

Would you say that in the last decade and a half, with all the technical advances which we have made, there has been a corresponding advance in air safety?

There has been a steady improvement, as statistics show. Of course, you can point to this recent batch of accidents to charter aircraft, but I hope they are just a temporary phase.

But do you think there are the same reserves of safety, or the same margin for error, as there was in your day as a pilot? I am thinking particularly of the lower stalling speeds, lower speeds for take-off and landing, fewer things to go wrong and fewer passengers herded together if they did go wrong. Has there not been an undue emphasis on speed?

With that I entirely disagree, and the figures will bear me out. True, the machines are faster but there are so many more aids. The improvements in navigation and landing aids more than offset your point about speed and complications. Just look at the annual safety figures since 1946, and you will see that I am right.

I am not sure we should take 1946 as our reference year; but now may I turn to comfort? There is a growing school of thought which holds that flying is not so agreeable a means of transport as it was ten years ago; would you agree to that?

Of course, we are flying faster, which means we are not sitting for so long. The question of comfort really boils down to a question of fares and what the passenger is prepared to pay. One way of bringing fares down is to pack more people into one compartment. Either you have less room to spread out or you pay higher fares.

But can't we get a better balance as between comfort and speed? Lord Brabazon, for example, suggested that another 18in of fuselage width, even at the sacrifice of a few knots, would be a more civilized utilization of the available power; isn't that a reasonable thought?

One way of advancing the cause of civil aviation is to get as many people as you safely can into one aircraft with reasonable standards of comfort. There is a straightforward clash of interests here. Even if you did design your aircraft with more space, you would still come up against the same problem of how you were going to use it. The passenger would still want to travel more cheaply, and if it took him only two hours to get down to Nice he wouldn't complain.

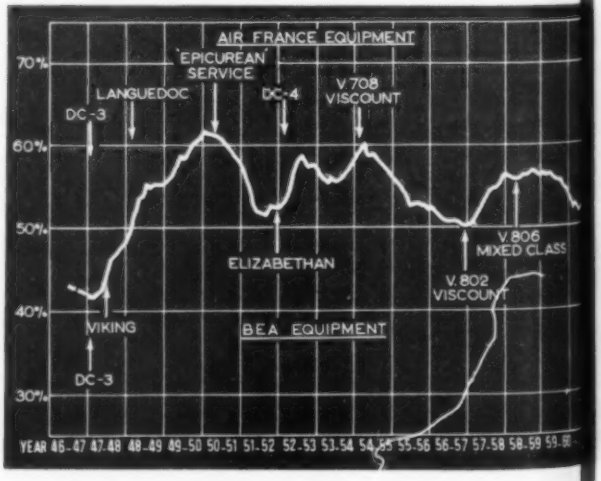
If you had to travel up to Birmingham by train in a seat as narrow as those in your aircraft, wouldn't you complain? And may I ask if you have yourself travelled tourist in the air?

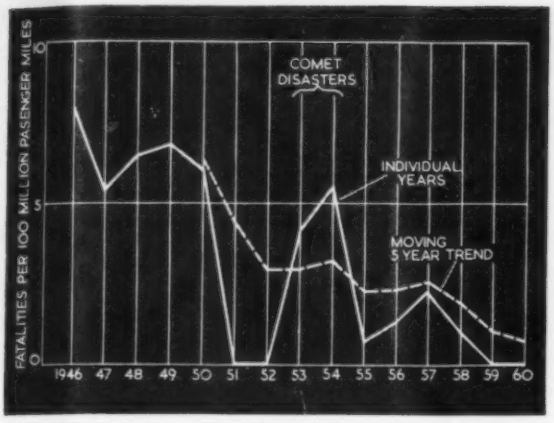
I don't think aircraft seats are so narrow; I have often travelled tourist on BEA and I *did* once travel one-way tourist to America. I found it reasonably comfortable.

And on a long-haul journey like that would you not have had a completely different sense of comfort in the flying-boat, or the old Stratocruiser?

On the contrary. I once went to Australia in one of those flying-boats; it took nine days to get there; we were wallowing about in all sorts of weather, and I was absolutely exhausted when we arrived. I don't think there is any comparison at all between flying-boats and the comfort of, for instance the Boeing 707. Less noise, and less vibration—which is very important.

BEA's share of London - Paris traffic (moving annual basis) in relation to introduction of new equipment by the corporation and Air France




FATALITIES PER 100 MILLION PASSENGER MILES
10
5
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COMET DISASTERS
INDIVIDUAL YEARS
MOVING 5 YEAR TREND
1946 47 48 49 50 51 52 53 54 55 56 57 58 59 60

Safety record of UK airlines (scheduled services), 1946-60

And you probably arrive now in the middle of the night as against the pleasant nights in hotels in the old days?

Yes, but in the old days they dragged you out at first light for take-off. I sleep very well in an aircraft—even in those allegedly uncomfortable seats.

I have always admired your general outlook on life, and I would have thought you would agree that human progress must be measured in terms of human dignity; I cannot think it is dignified to sit six abreast in a modern aircraft fuselage.

The object of the exercise is to get fares down. You must agree that BEA have so far been very successful; we have pioneered cheaper travel. We don't want to turn aeroplanes into rich men's luxury clubs; we want to get more people into the air.

I was not thinking of catering for sybarites; I was only suggesting another 18in on the beam. However, is there not another aspect? In your Royal Aeronautical Society lecture you pointed out that European traffic had increased by 800 per cent in the past 13 years, and that the most important reason for this growth was the reduction of fares. Yet you also showed that six of the nine airlines had unprofitable European operations because of low load factors. From this does it not look as if the aircraft with so many seats squeezed into them may theoretically show a low seat-mile cost, but that you are not filling the seats? Does that not suggest there is a case for being more generous with available space?

Not at all. I was talking about average load factors. You know full well that we have load factors high in some periods and low in others. You cannot have elastic aircraft and you cannot have a different type for each route. Actually, BEA average passenger load factors are still good in comparison with the others; they were 68 per cent last year, and are now 63 per cent.

If you extend your philosophy about the advantages of speed then logically you come to the supersonic; do you accept this?

No—or, at least, not for BEA. For BOAC on the Atlantic possibly, but our average stage is under 300 miles, and no aircraft can go supersonic within that distance. In my lecture I gave 700 miles as the stage below which there would be no use for the supersonic. And in crowded Europe the sonic-boom factor is an important consideration. No, I don't see BEA going supersonic in the foreseeable future.

Do you think, then, that this speed makes sense for the long-haul operator?

Yes, it would shorten the journey time and make it more comfortable, though from the point of view of economics it would be more expensive. It would probably mean higher fares—or subsidies. As I say, I am keen on getting fares down rather than on aiming at these tremendous speeds.

You rather shot me down when I made a similar point earlier?

No, there is some advantage in supersonic speed on longer routes—if you can get it without undue penalties in cost and booms. But there are a lot of ifs and buts about it.

If we need to balance one thing with another, as we now both agree—speed against safety and costs, and so on—would it not be a useful and interesting exercise to have some representative body sit down and consider, with all available experience before them, what would be the best type of air transport vehicle for the future? Might it not be possible that we should start a fresh line of development, rather than restricting effort on to building civil types round available military engines, or progressing from military tankers?

There is something in that. One could visualize an aircraft designed primarily for really cheap travel. But it is wrong to leave the impression that there has been no specifically civil development, particularly in this country. The Dart, Tyne and Spey are civil designs and, of course, the corporations and the private companies closely study these matters. We have been responsible for a good deal of development; there are examples in the Viscount, Vanguard and Trident. One's whole future depends upon the success of these machines, and the utmost care goes into our specifications.

I would have thought that there were two relevant points here. First, you are not specifying these types entirely from scratch; secondly, my hope is that enough operators may stop this business of trying to keep up with the Joneses and agree to some kind of standstill. If they were to agree to a really good production run on a type like the Vanguard—getting full value from the jigs and tools—then we should be in a sound position to provide cheap travel for the masses. Instead, the Vanguard appears to be an aviation mule with no prospects of progeny at all.

There is some sense in what you say, but this is a highly competitive business. Human nature being what it is, an airline will always come along and attract the traffic with a faster aircraft; and the correlation between speed and traffic cannot be overlooked. Look at this graph showing how the traffic between London and Paris has grown in direct proportion to the speed of aircraft used by BEA and Air France respectively. In one period we gain and in another Air France moves ahead. It's a basic fact that if you fly older aircraft your load factor falls. Within this framework, BEA's new aircraft like the Vanguard and Trident *have* been designed from scratch—they are tailor made for our network, in fact, just as the Viscount was.

We still fly 62 Viscounts, but we can't fly them competitively against jets. That is why the Vanguard does not seem likely to have progeny.

You have achieved some remarkable weekend fare reductions to Belfast and Glasgow. Is there any chance of extending them to other routes?

That is governed to some extent by the mail contract. It is rather a special case, and only made possible by the volume of freight and mail carried. But we shall certainly pursue this policy wherever it seems to be a practicable proposition.

When it comes to the possibility of exploiting low fares in a particular area, or furthering the interests of British civil aviation generally, do you think we might be better served if we had a licensing board with an overall responsibility to plan Britain's effort positively, rather than one which hands out licences as prizes?

Apart from the Board's attitude to recent applications, I think there is something in what you say, though I don't see how it would work out. Any airline would object if this outside board butted in and told them what to do about their operations.

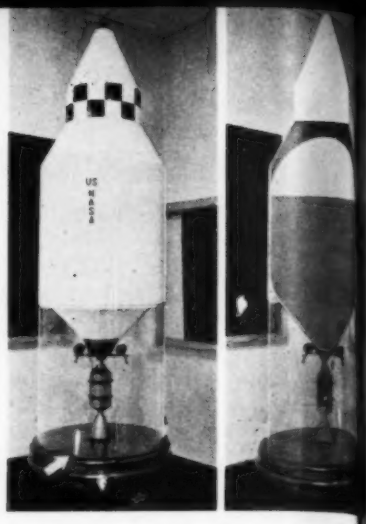
Against the background of this need to plan Britain's aviation resources as a whole, instead of piecemeal or in a patchwork fashion, what do you say about the Board's recent decision on the European applications?

I personally think that British air transport would progress in more orderly fashion, and also more quickly, if we retained the previous regime of two nationally owned corporations each working on a long-range plan for scheduled operations. Now that we have Tom, Dick and Harry muscling in on the act, it is difficult to see how an orderly, well-thought-out overall plan for developing scheduled operations can come about.

FORTHCOMING EVENTS

Jan	1	Institute of Transport (Metropolitan Section): "Development of an Airport," by Maurice G. Housego.
Jan	4	RAeS: Young People's Lecture, "Airliners of the Future," by Godfrey H. Lee.
Jan	5	RAeS Rotorcraft Section: "Rotating Aerofoils and Flaps," by Dr S. Neumark.
Jan	10	Guild of Air Pilots and Air Navigators: Livery Dinner.
Jan	11	Northampton College of Advanced Technology: "Vickers Aircraft," by H. H. Gardner.
Jan	15	RAeS Historical Group: "R.101 and Other Airships," by Sir Harold Roxbee Cox.
Jan	16	RAeS Astronautics and Guided Flight Section: "Development of Seaslug," by C. Bayly and A. Lightbody.
Jan	17	BritIRE (Computer Group): "VERDAN—a Miniature Computer for Airborne Use," by B. B. Rayner and S. Morleigh.
Jan	20	Aircraft Recognition Society: All-England Competition.
Jan	24	RAeS Graduates' and Students' Section: "The New Bluebird," by K. W. Norris.
Jan	26	RAeS Man-powered Aircraft Group: "Design Philosophy of Man-powered Aircraft," by J. J. Spillman.
Jan	29	RAeS: Joint discussion with Institution of Electrical Engineers.
Jan	30	Institute of Transport (West Middlesex Group): "The work of IATA and the Clearing House," by A. J. Quin-Harkin.
Feb	2	RAeS Rotorcraft Section: "Rotor Flow Visualization," by Prof J. Valensi.

Missiles and Spaceflight



News of nuclear-rocket progress in the USA is given on this page. This model shows a proposed nuclear-rocket upper stage studied by Lockheed Missiles and Space Company, in which a massive hydrogen tank is located above the relatively small engine. Height of the stage would be over 100ft

NUCLEAR-ROCKET PROGRESS

A contract for the design, research, development, fabrication and testing of a nuclear rocket stage is to be awarded by NASA's Marshall Space Flight Center, Huntsville. This vehicle, known as the reactor-in-flight-test (RIFT) stage, will be launched in 1966-67 as an upper stage of a Saturn rocket. Twenty-nine firms were invited to a pre-proposal conference at Huntsville on December 7, and proposals were due within 30 days.

Company proposals will be evaluated in two stages. Initial proposals will contain information on the firms' capabilities and experience. After these have been evaluated a smaller number of firms will be invited to submit detailed offers including cost information and technical approach based on complete specifications. Fabrication and assembly of the RIFT stage will be at NASA's Michoud plant, New Orleans, and the nuclear rocket engine which will be flight-tested aboard the RIFT stage will be the Nerva (nuclear engine for rocket vehicle application).

A first-phase development contract for Nerva was negotiated in July between the joint NASA/Atomic Energy Commission Space Nuclear Propulsion Office and Aerojet-General Corporation. Responsibility for the nuclear portion of the work was subcontracted to Westinghouse Electric Corporation. Nerva is part of the Rover programme, and the reactor to be used in Nerva will be a follow-on to prototype Kiwi B reactors under development at the Los Alamos Scientific Laboratory.

A contract for a second engine test stand for the hover programme to be erected at Jackass Flats, Nevada, is being negotiated by the Space Nuclear Propulsion Office with the Aetron division of Aerojet-General. The Nerva engine will be tested on these two stands, and the new contract is estimated to involve a cost of approximately $8m.

Earlier this month NASA announced that testing of the Kiwi B reactor would be resumed soon at the Nevada test site. This reactor was damaged by a hydrogen gas explosion which occurred a few hours before a scheduled power run on November 7.

UN RESOLUTION ON SPACE

Following the first meeting of the United Nations Committee on the Peaceful Uses of Outer Space on November 27, a four-nation resolution to declare outer-space "free for exploration" by all States in conformity with international law and divorced from sovereign rivalry was introduced on December 4 by Mr Adlai Stevenson of the USA. The resolution, co-sponsored in the General Assembly's main political committee by the USA, Australia, Canada and Italy, proposed that the UN should provide a focal point for international co-operation in the peaceful exploration and use of outer space, and gave examples of specific aims.

Ambassador Adlai E. Stevenson, the US representative, stated:—

This is year five in the age of space. Already, in four short years, scientific instruments, then animals, then men, have been hurled into space and into orbit around the Earth. Within a few more years, satellites will bring vast new developments in weather forecasting and in world-wide telephone, radio and television communications. More than that, rocket booster capacity will become sufficient to launch teams of men on journeys to the Moon and to the nearest planets. And after that, one can only speculate.

Unhappily this astounding progress in space science has not been matched by comparable progress in international co-operation. In the race of history, social invention continues to lag behind scientific invention. We have already lost valuable time that can never be recovered.

The small nations have an overriding interest in seeing to it that access to space and the benefits of space science are not pre-empted by a few nations—that space exploration is not carried forward as a competition between big power rivals—that the ideological quarrels which so unhappily afflict this planet are not boosted into space to infect other planets yet unsullied by quarrels of men.

All nations can play a part in assuring that mankind derives the maximum advantage from space technology in the here and now, and not just in the hereafter. Every nation can co-operate in the allocation of radio frequencies for space communications. Every nation can participate in global systems of weather prediction . . .

In outer space we start with a clean slate—an area yet unmarred by the accumulated conflicts and prejudices of our earthly past.

We propose today that the United Nations write on this slate boldly, and in an orderly and a creative way—to narrow the gap between scientific progress and social invention—to offer to all nations, irrespective of the stage of their economy or scientific development, an opportunity to participate in one of the greatest adventures of man's existence . . .

The first part of this programme looks towards a régime of law and order in outer space based on two fundamental principles which should commend themselves to all nations.

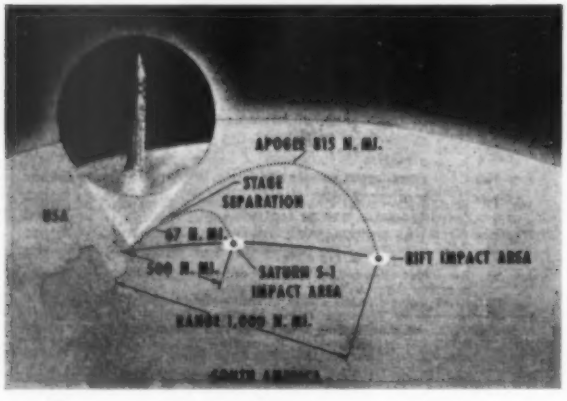
The first principle is that international law, including the United Nations charter, applies to outer space and celestial bodies. Now that man has found means to venture beyond his earthly environment, we should state explicitly that the rules of good international conduct follow him wherever he goes . . .

The second principle is that outer space and celestial bodies are free for exploration and use by all states in conformity with international law and are not subject to national appropriation by claim of sovereignty or otherwise . . .

Freedom of space and celestial bodies, like freedom of the seas, will serve the interest of all nations. Man should be free to venture into space on the same basis that he has ventured on the high seas—free from any restraints save those imposed by the laws of his own nation and by the rules of international law, including those embodied in the United Nations charter . . .

The establishment of a complete registry or census of space vehicles would mark a modest but an important step towards openness in the conduct of space activities. It would benefit nations the world over, large and small, which are interested in identifying, tracking and communicating with space vehicles. It could lay the basis for later arrangements for termination of radio transmission and removal of satellites when their useful lives were ended . . .

The third part on our proposed programme calls for a world-wide effort under the auspices of the United Nations in weather research and weather prediction . . . The enhancement of our knowledge of the weather is only the beginning. In the more distant future looms the possibility of large-scale weather modification. If this power is to be used to benefit all rather than to gain special advantage for a few, if it is to be used for peaceful, constructive purposes—progress towards weather control should be part of a co-operative international venture . . .



The trajectory of a typical RIFT (see first news item) flight, involving Saturn S-1 and nuclear upper stage, is illustrated in this NASA diagram

Space technology has opened enormous possibilities for international communications. Within a few years satellites will make possible a vast increase in the control and quality of international radio, telephone and telegraph traffic. In addition, something new will be added—the possibility of relaying TV around the globe.

The United States wishes to see this facility made available to all states on a global and non-discriminatory basis. We conceive of this as an international service. We would like to see United Nations members not only use this service but also participate in its ownership and operation if they so desire . . .

The space programmes of the great powers are well advanced. Our own nation is proceeding with the development of satellite systems for weather forecasting and communications. In the months ahead important decisions will have to be made. If the opportunity for United Nations action is missed, it will be increasingly difficult to fit national space programmes into a rational pattern of United Nations co-operation . . .

On December 11 the General Assembly's main political committee "unanimously and with acclamation" adopted a revised version of the original four-nation resolution, co-sponsored by 24 countries including Britain and the Soviet Union. This followed a two and a half hour meeting on this subject between Mr Stevenson and Soviet Deputy Foreign Minister Valerian Zorin on December 8.

OSCAR IN ORBIT

The USAF Discoverer 36 satellite and the 10lb payload known as Oscar (orbiting satellite carrying amateur radio) were together successfully placed in orbit by Atlas Agena B from Vandenberg AFB on December 12. As reported last week, Oscar was designed and built by a group of radio amateurs in California. The initial orbit for both satellites was at an altitude of 152-305 miles, with an orbital period of 91.88min.

The Discover (36) capsule was recovered from the Pacific, north of Hawaii, on December 17 after 64 orbits, while Oscar continued in orbit. Lifetime of the amateur-radio payload was expected to be 30 days, or as long as its batteries continued to function.

A ROYAL SPACE FORCE?

Indications that the Air Ministry would favour a role in space for the Royal Air Force have come to the surface in recent weeks. This opinion was quoted in an article by the science correspondent of the *Evening Standard* on December 7, and had been implied the previous day in the House of Lords in a speech by Lord Waleran, a director of Ekco Electronics Ltd.

Extracts from Lord Waleran's speech are given below. The main report of the debate in which Lord Waleran spoke is on pages 945-946.

I believe it is vital to the security of this country [Lord Waleran said] that we should at least have a thorough appreciation of the military possibilities of space. . . .

I think that the House will agree that it is clear we have not the money or the scientific resources to complete with the United States or Russia over the whole field of space research, but I believe that unless we start to play a practical part in military space development we shall never gain a proper insight into its possibilities, let alone be able to start to make our national contribution to the Western military space programme. . . .

I do not think that we have to seek very far for projects which are both urgent and within our capabilities. First it is predicted that in about five years' time we shall be entering a period of intense sunspot activity, when long-range radio commitments will become highly unreliable. In view of our world-wide civil and military interests, should we not now be making every effort to introduce a satellite communication system in time to meet this emergency?

Secondly, the number of objects in space is increasing rapidly and by the end of the decade thousands may be in orbit, some of which will remain there over a number of years. If we are ever to contemplate a defence from attacks from space, should we not start now keeping track of the objects in space before the picture becomes too confused?

Because our resources and our practical experience are limited I do not think it would be sensible for us to start from scratch on an independent programme in these fields. Rather, we should seek collaboration with other countries on military projects as we are seeking to do in the ELDO programme. . . .

I hope that the consideration now being given to our space research programme by Her Majesty's Government will recognize and give full weight to the military aspect. I believe it demands the attention of a Services Ministry and the support of a research programme directed to military ends; and I suggest that the Royal Air Force would seem the Service best fitted by role and technological experience to be charged with this responsibility. . . .

I should like to finish my remarks by asking Her Majesty's Government three questions. First, does Her Majesty's Government recognize both the importance and urgency of a military space programme? Secondly, recognizing the limits of our resources and background knowledge, will Her Majesty's Government seek every opportunity of promoting and collaborating with the West in a joint military space programme, both long-term and short-term? Thirdly, will Her Majesty's Government immediately put in hand a military communications satellite to give us our first footing in space and to ensure reliable communications during the next period of sunspot activity?

This "Ballute" coated fabric drag balloon for re-entry deceleration of spacecraft has been developed for the Aeronautical Systems Division of the USAF Systems Command by Goodyear Aircraft Corporation

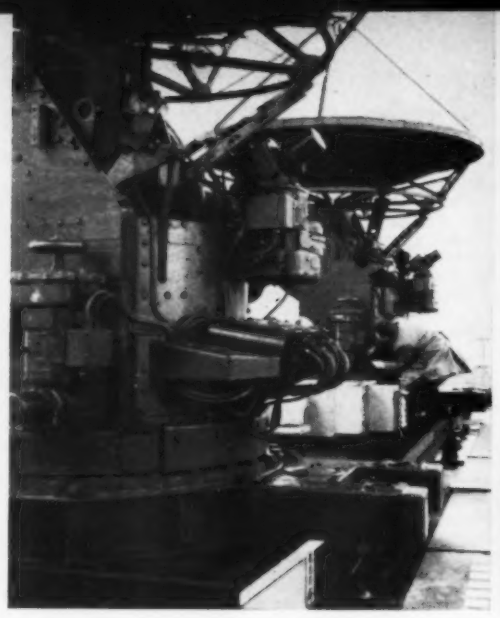
MERCURY TWO-SEATER FOR RENDEZVOUS TESTS

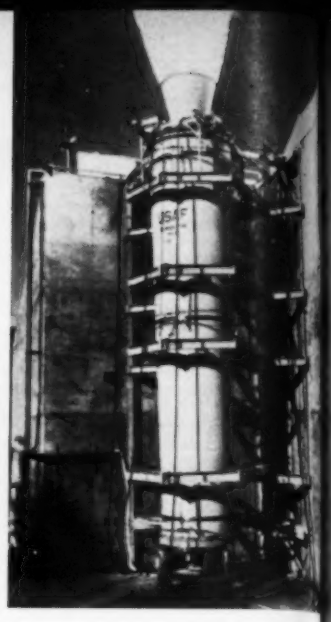
A larger, two-man version of the Mercury spacecraft is to be built by McDonnell Aircraft Corporation and used by the US National Aeronautics and Space Administration in tests of orbital rendezvous and docking manœuvres. Titan 2, produced by Martin Marietta, will launch the two-man craft, which will endeavour to rendezvous with an Agena stage launched by Atlas. Cost of the programme, including approximately 12 spacecraft, Atlas-Agena and Titan 2 vehicles, is estimated at about $500m.

Two-man flights are expected to begin in 1963-64, starting with several unmanned ballistic flights from Cape Canaveral and continuing with conventional manned orbits and, finally, "rendezvous fly-bys and actual docking missions." In addition to the rendezvous mission, the craft will be capable of Earth orbital flights of a week or more, thereby providing pilot training for future long-duration circumlunar and lunar landing flights. Initially, the seven Mercury astronauts will serve as pilots in the programme.

Whether or not the RAF introduces "space wings," as discussed above, Capt Virgil Grissom, USAF (left), and Cdr Alan Shepard, USN, received theirs at the Pentagon on December 6. Next to the photographs of the respective wings below is a drawing of the Soviet pilot-cosmonaut badge

Missiles and Spaceflight . . .





(Left) EMI Electronics Ltd claim to supply "telemetry equipment for use in every missile manufactured in the United Kingdom." The photograph shows cable connections being checked on mountings of EMI high-gain tracking aerials at the RAE missile range at Aberporth

(Right) News is given below of the successful static firing of this 500,000lb-thrust solid motor by United Technology Corporation

VIGILANT'S TWO WARHEADS

Brief details may now be given of the two types of warhead which have been developed for the Vigilant anti-tank guided weapon, now being put into large-scale production by BAC at Stevenage. The need to minimize weight in this one-man weapon system ruled out the squash type of head, and accordingly Vickers have developed an extremely effective hollow-charge head which they describe as having "very nearly optimum lethality for a hollow-charge warhead." As shown in the cutaway drawing published in *Flight* for July 27, this head has a diameter of 5in (appreciably more than the missile body diameter), and a weight no less than 36 per cent of the missile gross weight. It is this head which is being fitted to current production for the British Army.

In order to provide an exportable warhead, unrestricted by the inclusion of British Government design information, Vickers have reached an agreement with the Swiss firm of Constructions Méchanique du Leman, SA, established by the renowned French engineer Edgar Brandt during World War II. The CML plant near Geneva is extremely modern and well equipped, and their staff has considerable experience in this field. They are associated with the Belgium Mecar company, who will be responsible for production. The new "Energa" head, which has a diameter of 5in and has been designed to British standards of safety, has been produced in only 11 months, and its price is competitive. The fuze, which is highly sensitive, can operate at strike angles of "well over 70°"—presumably from normal. Twenty complete heads are now undergoing flight trials in Britain. The Energa head will be specified for all Vigilant missiles sold overseas.

RELIABLE CANBERRA DRONES

Canberra U.10 target drone aircraft, which were converted for pilotless flight by Short Brothers & Harland Ltd, are being used by the Royal Australian Air Force in missile trials at Woomera and by the Royal Navy in similar tests off Malta. More than 30 flights have been made from these bases at altitudes ranging from 50,000 to 54,000ft, and in every case the complex guidance and control systems aboard the aircraft have functioned perfectly. As a result, not one target has been lost because of failures occurring in its equipment. With other types of unmanned targets, say the company, roughly one aircraft in 15 is lost through equipment failure.

The U.10 was developed by Shorts for unmanned, "out-of-sight" operation in high-altitude guided-weapons tests. The company believe it to be the only large target aircraft in the world which can operate at heights greater than 50,000ft. This capability is a particularly valuable feature, as the U.10 is representative of the size of aircraft with which defensive missiles would have to deal. The U.10 also has an advantage in terms of endurance, for it is unique in that it can remain airborne long enough to permit three or even four separate firings during one flight.

On December 4 AEI announced that they had "just handed over another tactical control radar to the Royal Air Force." These powerful, three-dimensional radars were developed in conjunction with RRE, Malvern, as the initial stage of the Bloodhound SAGW system.

Aerojet-General have produced a liquid-propellant motor "about as large as a human thumb," developed for attitude control of spacecraft. Thrust is variable between 0.1lb and 0.01lb, and the propellants—hypergolic nitrogen tetroxide and hydrazine—are loaded by hypodermic needle.

On December 9 a Nike Zeus was fired at a very flat launch angle from Point Arguello down the Pacific Missile Range. This must have subjected the missile to unprecedented dynamic pressures, although the chief purpose of the test is said to have been to study the limits of the guidance and tracking radars. Another successful firing took place on December 14.

A booklet entitled *Die Blue Streak Rakete*, published by Rudolf Brock of Munich, gives some quantitative particulars of the proposed third stage to be developed by Germany. Prime contractor is named as Bölkow, and data include: overall length, including engine chambers, 6,300mm (248in); length of tank bay, 1,981mm (78in); length of probable payload compartment, 3,962mm (156in); diameter, 1,372mm (54in); gross weight, with 90kg (198lb) payload, 2,286kg (5,040lb); propellants, 1,950kg (4,299lb); burnout velocity, 27,350 to 38,600km/hr (approx. 17,000 to 24,000 m.p.h.).

It was announced by the US Defense Department on December 13 that the plan for a mobile Minuteman ICBM has been abandoned. As described in several past issues, it was originally intended that 600 missiles would be deployed, 450 in silos and 150 on special trains each carrying five. No clear reason has been given for the fact that the mobile concept has waned in popularity during 1961 after some $100m (£35.7m) had been spent on it. In announcing the cancellation it is suggested that "900 instead of 600" fixed-base Minuteman missiles may be bought, although—as noted above—the original figure was 450.

According to the *Sunday Telegraph*, "A Skybolt test missile has been successfully launched from a Vulcan bomber for the first time. The launching was over the West Freugh range in the north of Scotland."

It is reported that the NATO Council of Ministers, meeting in Paris on December 14, discussed the problems of the multilateral control of nuclear strategic missiles. The West German foreign minister is said to have supported the US offer of such missiles for NATO use.

United Technology Corporation have conducted a successful static firing on their largest segmented solid motor so far built. The prototype was built under USAF contract and assembled at Morgan Hill, near Sunnyvale, Cal. The complete motor weighed 140,000lb and the four segments stood 40ft high, the thrust chamber pointing vertically upwards. When it was fired on December 9, the mean thrust was of the order of 500,000lb.

General Dynamics/Pomona, prime contractor for the US Army's Mauler mobile surface-to-air weapon system, has awarded de Havilland Aircraft of Canada a $1.7m contract for development of an infra-red acquisition unit. We believe this to be the first missile development contract placed in Canada by a non-Canadian customer. Previously DH Canada had established a Guided Missile Division for work in various programmes which did not come to fruition.

New details of Entac have been released by the French Government, whose Atelier de Construction de Puteaux makes the anti-tank weapon in an all-Government operation. Each round weighs 26.4lb, has a span of 17in and length of 32in. Two warhead types are available, the specialized armour-piercing shaped charge being claimed to be the "most powerful" such head in service. Range limits are 1,300 and 6,600ft and flight speed 190 m.p.h. Control is effected via a bulky, 28.6lb box mounted on a stand and carrying a binocular sight. Entac, bought by the armies of France, Belgium and the United States, is a cheaper missile than Vigilant (now in inventory production for the British Army), but it has much more severe operational limitations.

The Earl of Bessborough

Missiles and Spaceflight . . .

UK SPACE RESEARCH: THE LORDS DEBATE

A REVIEW of opinions and facts on existing British space activity was accompanied by firm suggestions for two further developments in the House of Lords debate on space research on December 6, reported briefly in last week's issue. A communications satellite programme was strongly urged by the Earl of Bessborough, who introduced the debate; and Lord Waleran expressed his belief in the desirability of a military space programme (see page 943).

The references to the European Space Research Organization and the European Launcher Development Organization during the debate contained no new information, and indeed Lord Hailsham, Minister for Science, introduced misleading information by implying at one stage that all ESRO satellites might be launched by the initial three-stage ELDO launcher. As detailed in *Flight* of November 2, the initial eight-year ESRO programme now envisaged would require four heavy launchers of the ELDO type and some 30 smaller rockets of a type not included at present in ELDO's plans.

The Earl of Halsbury criticized the quoting of "by-products" or "fringe benefits" of space research as justification for a major space programme. On an official US document listing 53 such benefits, he stated, all but seven were trivial, doubtful, or "special pleading" for developments resulting primarily from other things. The remaining seven included one "economic non-starter" and two (concerned with plasma physics) which might equally well have come out of the hydrogen power research programme. Three of the remaining four were not fringe benefits but main space-research objectives, and the fourth and last was communication satellites.

Lord Halsbury gave examples of branches of science which might suffer if large amounts of money went into space research. Tropical medicine, agriculture, and geological surveying; nuclear physics; radio astronomy; and chemistry were mentioned.

Lord Bessborough summarized the objects of his motion in the House as follows: "first, to increase interest in this country generally in space research; secondly, to urge the Government to press ahead with the European satellite in conjunction with their allies and with industry, and thirdly, to urge the Government also to consider how the West may co-operate further with the Soviet Union in the peaceful uses of space." His reference to "the European satellite" referred to a possible communications satellite system—plans for which, in more than one speaker's opinion, the GPO should have disclosed.

Britain should go into space for technical and commercial reasons, Lord Bessborough emphasized, and not purely on academic and theoretical grounds. Further points from the debate are given in the following extracts:—

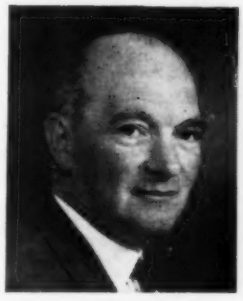
The Earl of Bessborough: Although it may now be possible—and I hope it will be—as between Governments to form the European Launcher Development Organization, it would seem to me to be valuable if private enterprise could ultimately also play its part, and if perhaps a proportion of the funds required from this country were to be raised, say, through the British Space Development Company, the consortium of ten companies over which Sir Robert Renwick presides. I am personally connected with two of them.

I feel that if the British Space Development Company were authorized to raise money by public subscription there might be hundreds of thousands of people in this country who would be inclined to risk a moderate investment on the basis of the calculated profitability of a communications satellite. I do not feel that the burden should lie solely on the taxpayers of the countries concerned, many of whom may have no desire whatever to risk even a small sum in such an enterprise.

I should add here that it would perhaps not seem to be right to appeal to the public to invest in this project until the applications of Blue Streak, with its French second stage and German third stage, have been clearly defined.

I do not think that I have seen a definite statement from the Government that the application—that is to say, what is to be put on top—will consist of a communications satellite. I hope that the Government will make a definite statement in this respect as soon as possible. There seems to be a general feeling in official circles, and in industry, that the launching of such a satellite, mainly for telephony, would be desirable. When the application has been defined, I would hope that it might then be possible to form an international company, perhaps similar to the old Suez Canal Company, in which private enterprise as well as governments would have an interest. . . .

The Earl of Halsbury: It seems to me that there has been a tendency for four major sources of misunderstanding to cloud our judgment in discussing this subject. The first is almost a myth. It was derived from the spectacular success of the Manhattan project and the explosion of the first atomic bomb, followed by the fairly rapid conversion of energy to that provided by a nuclear power station. The myth is to the effect that scientists can do whatever you ask of them at short notice if given a sufficiently large sum of money . . .



The Earl of Halsbury

The second confusion lies in the distinction between engineering means and scientific ends. It is true that the tools in some branches of science that deal with research have become very expensive. One thinks immediately of giant particle accelerators that cost millions and millions of pounds. Nuclear physicists use them in order to study the sub-nuclear structure of matter. The same is true of the launching vehicles for spacecraft. All these devices are triumphs of engineering rather than triumphs of science. They are engineering means to scientific ends . . .

The third confusion which I think afflicts this subject relates to the uselessness of a general truth as an aid to discriminating between particulars to which it applies. It is generally true that all scientific research tends to overflow into quite unexpected and very often beneficial directions which have quite surprising results. However, the generality of this truth makes it quite useless as a means of discriminating between one project and another, for it is equally true of all. Whether we try to put rockets into orbit, on the one hand, or on the other hand to drill holes in the bottom the North Sea to look for natural gas, I am sure that unexpected benefits would derive from either.

The fourth source of confusion is the fact that the public are not sufficiently aware of how disappointing are the actual fringe benefits currently coming out of the cold war weapons research. . . .

When so much of direct concern to us is in jeopardy, or may be going by default, what real justification have we for spending, in the name of science, the massive sums required by space research? I am not an enemy of space research as such. I would only ask that whatever we spend on it for scientific purposes should bear some reasonable proportion to the scale on which we support science as a whole. In saying "reasonable proportion," I do not mean any kind of barren equality. I am not concerned with disparities of expenditure by factors of two or three, as between one subject and another. But the programme begins to look unreasonable, however, when disparities of the order of two or three hundred become involved. On this scale the whole cost of any space research project must fall right outside any limit which can be called reasonable.

Viscount Caldecote

Therein, of course, lies a major difficulty, which I acknowledge. A decision to sponsor space research will almost certainly be based on mixed motives. Military men will want space facilities for some purposes; politicians will want them for others; the telecommunications industry may want them for purely commercial reasons; and its proposals must stand or

Missiles and Spaceflight . . .

fall by the economic character of the commercial investment represented. Scientists, too, would like to see some space research done. . . .

Lord Kindersley: Whether it be a national, a Commonwealth or a joint European venture I urge the Government to take courage in both hands and to embark without too much delay on a programme to prove that a successful communications satellite can be launched; and I am convinced that over the years and in the foreseeable future there can be a substantial financial return to meet the cost of developing the system.

I am of the opinion that this country cannot afford, either on its own or in conjunction with the Commonwealth, or with other European nations, to delay or exclude itself from the development of the communication satellite system.

Lord Fleck

Viscount Caldecote: On the subject of communications satellites, there is still a very great deal to be done in this field. There is a great deal of investigation work to be done to make sure that a communications satellite will be an economic proposition. Until that work has been done, it is quite impossible to assess the economic possibilities. At the moment, it looks as though a communications satellite would be of great value in transmitting television pictures round the world, and in making a very great increase in the number of telephone channels available. Whether this will be an economic proposition must depend upon whether a substantial increase of telephone users, who will make use of this facility, comes about.

It is rather dangerous in this field to draw analogies from the North Atlantic traffic, which I believe is quite unique in its density, and is quite different from the traffic which goes on in other parts of the world. There will be many difficult problems of judgment to solve before we can be reasonably certain that a communications satellite—as, for instance, a European-Commonwealth communications satellite—will be a paying proposition, for it seems likely that the North Atlantic one is almost bound to be put up by our friends in America.

Nevertheless, I am quite clear that we must go ahead as if we were going to enter this field, and go ahead with all speed, and the investigations of the economic possibilities must go ahead alongside the technical advances. There is one rather sad aspect of the work which is going on at the moment in that it seems to me to be shrouded in so much unnecessary security and secrecy. Would it not be possible for British industry as a whole to be informed, not necessarily of every detail but in a broad way, of what the Post Office proposals are, and what the Government's intentions are, in this field? . . .

Lord Fleck: So far as concerns responsible organizations in this country—that is to say, organizations with a research programme and the means to carry out extensive work on that programme—the generally accepted definition of the research work to be undertaken is research work carried out by instruments launched by rockets. They may be vertical sounding rockets or satellites. What I wish to emphasize particularly is the broadly accepted view that our research should be carried out by instruments. That means that, so far as responsible organizations are concerned, they are not interested at this time in putting a man into space. . . .

How should this country carry out its agreed "space-research-by-instruments" policy? The Royal Society is much involved, and within its precincts many voluntary committees meet to further the work, a large portion of which is done in universities, under the general guidance of Sir Harrie Massey as Chairman of the British National Committee on Space Research. The detailed executive technical work, with the co-operation of the Royal Aircraft Establishment, is in the hands of two men (and I emphazise that) seconded to the Royal Society from the Ministry of Aviation. I would suggest, with considerable emphasis, that this is not sufficient; I would go further and say that it is totally inadequate for the important objectives that are involved. . . .

I believe this possibility [communications satellites] to be of great interest to the Post Office people but, so far as I am aware, practically no specific information has been made public. I would hope that the Minister will agree that, as a first step, this House could rightly expect some specific information on the factual position. . . .

Viscount Hailsham: The current [Skylark] programme this year alone will extend to between 15 and 20 firings of the Skylark rocket. Ten will carry experiments selected under the aegis of the Royal Society from proposals made by research workers in universities and Government Departments. They will deal with all aspects of the physics of the upper atmosphere and studies of the Sun and stars. Six will be simple rounds carrying grenades for meteorological observations under a Royal Society programme. . . .

The cost of the rockets for this programme in this year is of the order of £200,000. . . .

The launching of the first satellite provided under these arrangements is scheduled for next spring. Work on two more satellites is well advanced. . . . It is flattering to be told by the Americans that they regard the payload of our first joint satellite as one of the most sophisticated within their experience.

The experiments are now being financed by DSIR grants at an annual rate of about £160,000, on the advice of the Royal Society. Substantial sums are also being spent on similar experimental work within Government research establishments, particularly the Radio Research Station.

The experts all seem to be agreed as to the technical feasibility [of a communication satellite system], and they also agree that if a commercial system can be put into operation it will enormously increase the capacity available for handling the ever-growing volume of international traffic, including television. So much, I think, is common ground. . . .

But there is not yet the same measure of agreement about the commercial prospects.

In parallel with the studies made by the British Space Development Company, studies of a possible design have been made jointly by the Post Office and the Ministry of Aviation. . . . There is, at first sight, a very wide difference between the company's conclusions and those of the Post Office. It is, perhaps, natural that the Post Office should take a more cautious view, and the assessment of some of the elements that enter into a commercial assessment of satellite communications must be matters of opinion. But there is no doubt that a wide difference does exist.

I understand that the company's estimates of the cost for establishing a system are less than half the estimates made by the Post Office, and the company assume a much faster rate of growth. For these reasons the Post Office consider that they must look forward to a date considerably later than that estimated by the company as the date by which a satellite communication system could begin to pay. . . .

Viscount Hailsham

I would say that we are not in a position to ignore space research unless we are willing to opt out wholly of some of the most exciting developments in physics, astronomy and the Earth sciences, and engineering and technology. . .

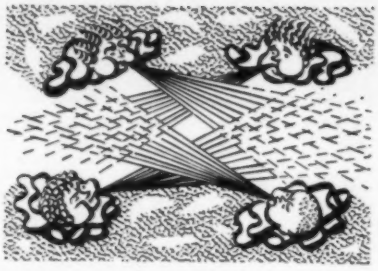
We can no more avoid space research in some sense, and on some scale, than the early sixteenth and seventeenth century natural philosophers could avoid, in their time, the use of the telescope and the microscope, which for the first time opened new horizons beyond the limits of ordinary natural human vision. . . .

European co-operation combines several solid advantages. It enables us to co-operate with European countries in a field not already hopelessly confused with previously adopted attitudes, political issues, and even emotional undercurrents. We should preserve and develop thereby an advanced large rocket on this side of the Iron Curtain. We should be co-operating with countries who are in the same class economically, scientifically, technologically and politically. . . .

On our scientific space research programme identifiable Government expenditure now amounts to about £550,000 a year. This will increase, perhaps, more than tenfold over about ten years, to a level which must depend on whether ESRO comes into being and is on the scale now being studied by the preparatory commission. . . .

My guiding light has been to stick to decisions which can be justified as scientifically correct. This has not always been easy. There are many Dan Dares among our adult population who look upon the thing principally as a form of international sporting contest for the sake of prestige. Other countries, with military axes to grind, and vastly larger national incomes, can afford programmes immediately motivated by a desire for national prestige rather than scientific achievement. I do not think that we can do this and, if we could, I do not think I could recommend it.

I believe, with the Advisory Council on Scientific Policy, that the real path to international prestige in the scientific field is the adult path of pursuing what is scientifically or technologically worth while, and worth while in the context of this country's situation, and not in the situation of some other country. . . .



1972

Fear of the unknown is a common emotion, especially among those whose lives are spent in the realms of aeronautics and spaceflight. We are glad to present these notes on the outstanding events in these fields which may be expected to occur in 1972. There are morals to be drawn a-plenty; and what a brave new world is unfolding before us!

JANUARY

JANUARY 1 is the coldest day of 1972 so far. Cold War grows colder, as East German president Herr "Great Wall" Grotewohl proudly announces that barricade between East and West Germany has now reached height of 50m (164ft), with no gap between Czechoslovakia and Baltic. In West, 14 armoured divisions are required to supply tank crews for "sullen glare" duty, staring at East German tankers on other side of wall. US Army reconnaissance system 885L, with one pilotless helicopter every 120yd checks that East Germans haven't gone away.

Meanwhile in Washington Senator Krapschuter denounces The British. "These so-called allies always reckon trade more important than the need to keep up the Cold War. While our missile industry lays off men, they have sold 2,450 Super VC10 transport planes to the Chinese; and now they are engaged in the unlawful export of Portland stone to East Germany, for their lousy wall." President of the Board of Trade explains: "The stone is actually exported to West Germany. Transport Command Belfast squadrons have a daily commitment of 3,800 tons, delivered to the west side of the barricade. When morning comes, the stone has gone. The fact that the wall has risen is not Britain's affair."

Latest survey shows world nuclear stockpile has reached 6,854,939,554,280 kilomegatons for each member of human race.

British civil war is narrowly averted, as lone RAF guard-dog thwarts attempt by Free Rutland Army to take over Bloodhound missile base at Woolfox Lodge. This base had been regarded by FRA as only serious menace to FRA Victor bomber base at Cottesmore, taken over without violence in 1968. With Victors impotent again, it seems only matter of time before integration of Rutland with neighbouring counties—proposed in Local Government Act of 1964—becomes accomplished fact.

Having watched fortunes of FRA carefully, Free Middlesex Army issue proclamation declaring continued will to resist integration with Greater London. Chief FMA base is Northolt, equipped with TSR.2s bearing the red shield and triple swords of threatened county. Sir John Cunningham, Deputy Lieutenant, declines post of AOC Free Middlesex Air Force; in his view, "These activities are the work of a few extremists; and anyway they ought to use Vulcans."

FEBRUARY

FAI ratify world record for absolute speed over 100km circuit. Valery Dishklov, flying a Type 886G, sets figure of 17,603.45km/hr. US Air Force complain at Soviet Union's continued use of "fictitious designations," and ask FAI for picture of the 886G. FAI supply photograph of Valery Dishklov.

Efforts to extend English as standard NATO language continue to be thwarted by national adherence to native tongues. When *Flight* interviewed French engineer working on launch pad at Woomera he retorted, "A bas le Hot Streak second-stage quick-release lox coupling valve Anglais!"

Relations continue strained between US Department of Defense and American Federation of Labor. It was in 1965 that Air Force decided that, since ICBM base construction workers were earning more than basic pay of a full general, as many as possible should be replaced by all generals on active duty. This had advantage of keeping top brass fit without non-productive physical training, and also gave Air Force democratic public image. Unfortunately, AFL objects to fact that generals have formed exclusive branch of AFL (Local 78896X), while Air Force staff are lukewarm towards proposal for another generation of ICBMs.

Minister of Aviation starts to reassure House that Britain's interest in space is of purely peaceful and commercial nature, but is interrupted by Secretary of State for Air, who says, "My honourable and gallant friend should by now be aware that the Royal Air Force feels bound to take more than a passing interest in this new, and challenging, field of endeavour. In fact, I can now reveal to Members that the College of Heralds have all but approved the badge which will distinguish the several hand-picked personnel earmarked for the new unit."

MARCH

Spaceflight Editor calculates that eminent scientist Dr Aloysius Krautsch has now presented the same lecture 5,663 times at 3,785 meetings. Originally entitled "A Review of the Factors Affecting the Choice of Cheese as an Ion-producing Material," and read before 1963 Interplanetary Physics Colloquium held in Wapping, it has on 1,996 occasions had a variety of different titles. Unfortunately, Dr Krautsch has had no time to conduct any research during past nine years, but his expenses of $65,850,792 have greatly reduced his company's tax assessments.

Magistrate at Bow Street complains of increasing tendency on part of nuclear-disarmament demonstrators towards violence. "It is justifiable to protect yourselves against the worst excesses on the part of the police by carrying coshes, broken bottles, and things of that nature; and I personally would have been prepared to take a lenient view of the affair at Holy Loch in 1968, when the *Proteus* was sunk for the third time. But this use of wire-guided missiles in Trafalgar Square cannot be tolerated. You will each pay a fine of fifty cents."

Congress votes $786,000,000 to add sixth side to Pentagon to forestall boast by Soviet

Visiting New York, leaders of the industry are amazed to inspect a piece of the Moon

1972 . . .

Prime Minister "Our rocket guidance and soft-landing techniques are so refined that we could place a Red Star squarely on the Pentagon." US Bureau of the Budget plead in vain to reduce number of sides to four, thereby making available office space for shipment to mushrooming NASA centre at Houston, Texas. White House Press Secretary claims it is only prudent to take such measures, "Even though we suspect Mr Krushchev may not have been quite sober."

Residents of Stanwell Moor hold protest meeting at London Heathrow to try to get piston-engined aircraft banned. Spokesman says, "It's not so much that they're noisy; it's that the noise is so different."

William B. Coughlin, receiving award from US Aerospace Writers Association as "The best Editor of 'Missiles and Rockets' for 1971," says: "I would like to thank the US armed forces, NASA, and the US aerospace industry for enabling us to run 870 pages weekly. But the Publisher doubts the value of having a specialist editor in each country belonging to the Europe/Afro/Asian Space Launcher Development Organization. None of these 82 men has yet filed a story, except for the Italian Editor's moving essay on how Discoverer MDCCCXLVIII looked as it passed over Florence."

Visiting Moscow, leaders of the military are amazed to inspect a piece of Venus

had not the milling throng prevented them from lowering the stairway. When fire appliances reach scene, 17 hours later, they find among the charred wreckage remains of Port Authority crash/fire rescue VTOL, which could have prevented disaster had it not collided with helicopter carrying news cameramen.

Ministry of Aviation purchase second-hand WB-66 laminar-flow test bed aircraft. In Minister's words: "The gains which accrue from laminarization are enormously valuable. It is to be regretted that no development along these lines has taken place in this country."

MAY

Contracts Branch of Industry Liaison Division of Manufacturing Sub-committee of Hardware Council of Euro/Afro/Asian Space Launcher Development Organization start to investigate feasibility of placing contract for hardware. It is agreed after 127 meetings that

Visiting Farnborough, leaders of the public are amazed to inspect a piece of the Earth

APRIL

Director-General of SBAC asks Editor of "Flight" whether he can organize fund to pay fines—totalling £67.35 on this occasion—imposed on managing directors of British Aircraft Corporation and Hawker Siddeley Aviation, for wilful obstruction. Again they have refused to leave steps of Ministry of Aviation's new offices when requested by police to do so. It appears they are protesting against announced policy of HM Government not to support development of any new aircraft or missile until it has been purchased by at least six overseas customers. Minister himself finally offers to pay fines, as gesture of goodwill.

Hockenheimer Rigid Spline Co, of Kansas City, announces formation of Hockenheimer International, with headquarters in Geneva, Switzerland, Europe. Sales offices are to be opened in Paris, Bonn, Rome, Madrid, Brussels, Amsterdam and at 60 Walworth House, Peabody Mansions, Newington Causeway, London, England, home of Maurice Klein, president of Hockenheimer International. US Department of Commerce estimate European subsidiaries of US firms now outnumber European firms five to one.

Hundreds are drowned when vast crowds, estimated to exceed 4m invade NY International Airport and spill over into Jamaica Bay. Attraction is a UST-4 Mach 3.3 airliner, which lands with one engine on fire. Aircraft, not yet delivered, was flown by United Supersonic Transport crew, who would have escaped

component with longest lead-time will be forward dome of inner heat-shield for photon engine of 14th stage. It is found that, of 26,635 European, African or Asian companies registered as competent in this field, 25,631 have fewer than three employees and only two of remainder employ a graduate engineer. At 128th meeting it is agreed to accept free offer of a similar part from Soviet Union, disturbed minority voting to buy such device from NASA.

In last endeavour to "sustain the credibility of the RAF V-force as a deterrent," Minister of Aviation reluctantly agrees to allow £5,500.00 to be devoted to ingenious Purple Lettuce electronic countermeasure system, which makes Mk 7 Vulcan look like a Lancaster. Following day Treasury point out that Air Ministry actually have two Lancasters, and these are hastily pressed into service, equipped with Red Lettuce to make them have appearance and performance of Vulcan 7s.

Lord Edwardes of Leatherhead shows Lord Burke of Nast Hyde round Weybridge. Lord Burke notices BAC-222 with 20ft elephant tusks for president of 'Mbishi-Bashi. In his view it is unwise to design for just one customer, but host replies that three overseas production licences are being negotiated.

Minister of Air Transport allows appeal by BEA against licence granted by ATLB to Primrose Airways, whose restored Dragon Rapide operates from Gatwick to connect with trains of Bluebell Line from Horsted Keynes. As Minister puts it: "I know material diversion when I see it."

JUNE

Cost of hospitality suites at US Air Force Association Annual Convention and Aerospace Panorama exceeds $1,000,000,000 for first time. Managing directors of BAC and HSA manage to land contract for disposal of empty liquor bottles, at 10c each, and also conclude deal to buy two suites—less chairs and carpets—for 1963 Paris salon.

Spaceflight Editor asks Minister of Space Research, for twenty-seventh time, what operational satellite is to be launched by Euro/Afro/Asian space launcher when development is completed. For twenty-seventh time, Minister replies, "I am not quite clear what the questioner means by 'operational satellite'."

Robert B. Hotz, dean of US aerospace editors, is summoned to Bar at UK House of Commons to explain why his journal has published full details of TSR.4 weapon system envisaged as TSR.2 replacement for RAF and Kuwait Air Force. Hotz is disappointed with the Bar, and also complains at touchiness of British security. "For years," he says, "I've gotten real mad whenever the guys on 'Flight' try to pretend my magazine is called 'Aviation Leak'. They just don't appreciate how difficult it is to edit all the stories filed by our 450 foreign aerospace editors."

Continuing policy of developing the Belfast for potential cheap-fare mass market, Short & Harland offer the SC.5/48. It could accommodate 364 first-class passengers, on three decks, together with 36 washrooms, 14 galleys, eight bars and six lounges; alternatively, comfortable seating for 624 tourists, with break-even fare to New York, with all seats sold, of £8.25.

BOAC chairman, angrily tripping over Short & Harland sales team outside his office, drives to Ministry of Aviation to sign contract for nine UST-5C Mach 3.35 airliners, each costing £13,450,000.00 with spares. They will operate hourly "Chief Executive" services on all major trunk routes, at seat-mile cost of approximately 67c. BOAC undertake to sell these aircraft as soon as British counterpart can be placed in service.

JULY

US State Department demands return of A-5 series Polaris missile, fired from Free China submarine "Tee Hee Bang" (ex USN "George Washington") during trials down Taiwan Sea Range. Missile was caught in net trawled by Japanese fisherman, who is not only marketing transistor radios made from guidance system but is claiming damages for holes burnt in net.

At IATA conference in Hong Kong, passenger Class No 9 (standing) is amended, making it mandatory for all such passengers to be loaded pressed against each other, complete load then being secured by movable bulkhead. This prevents passenger movement, even in severe turbulence, without need for overhead strap-hanging systems, which have raised stressing problems in some aircraft.

Delegates at 7,445th meeting of general council of Euro/Afro/Asian Space Launcher Development Organization come to blows while attempting to choose name for vehicle. Meanwhile, delegate from Channel Islands points out that an additional stage must be added in order to provide sufficient area to stencil names of 82 participating nations.

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wish you a
Merry Christmas
and happy
landings in the
New Year
BEAGLE

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1972 . . .

Members of AICMA (international aerospace constructors' association) issue statement blaming over-intense competition for sick state of industry in all major countries. Results of 1971 are regarded as clear warning to get back to serene atmosphere of ten years previously.

Tanganyikan army evaluates its own wire-guided anti-tank missile, in competition with those produced by 196 other nations.

AUGUST

Biggest news of 1972! Following extensive test programme of Apollo capsule in Earth orbits, NASA announces successful landing of AA-14 on Lunar surface. Crew is Capt Cyrus B. Schmaltz, USAF; Lt Hiram B. Schmitz, USN; and Col Duke B. Hickenhackenpeffer, USMC. Location is 14 n.m. south of mid-point of Mare Imbrium. Radio message from Lunar surface is awaited. . . . After 17 days, Soviet Union offer to help locate crew of AA-14. President overrides State Department objection that this is propaganda move. Soviet Lunar Base No 49, with permanent staff of 3,240, send out eight search parties. . . . Crew of AA-14 are discovered feverishly trying to mend radio with makeshift tools. Soviet team offer use of own radio, and say Apollo radio spares could be put aboard next replenishment launch from Baykonur. Col Hickenhackenpeffer politely declines, and says Free World must not be made to look small. He deals harshly with Capt Schmaltz, found taking part in Cossack dance, with Lunar Vodka bottle in hand. Schmaltz is carried aboard AA-14, which then departs for Earth with crew in very bad temper. . . . Crew of AA-14 ride in state through New York City, with 50 Press Officers putting finishing touches to story. Fact that Soviets are on Moon is mentioned. Radio company president is found shot.

Managing directors of BAC and HSA are again asked to move on by police guarding MoA steps, and are arrested at 2 a.m., sleeping on Embankment under newspapers giving details of next stage of British Railways £780,600,000.00 electrification.

GPO go-slow delays writing of press release describing plan to launch communication satellite "during the coming decade."

Crisis in Euro/Afro/Asian Space Launcher Development Organization. While celebrating 28th anniversary of Holland's liberation in 1944, Dutch scientists shout rude names at German team responsible for third stage. To prevent recriminations, men responsible are assigned to other work, helping Indonesia develop tenth-stage propellant-loading computer.

SEPTEMBER

US carriers ask CAB to apply "cease and desist" order against Fuzzy-Wuzzy Airlines, claiming that serving of human flesh on "Golden Cannibal" jet services constitutes some kind of infringement. CAB cannot find chapter and verse; under terms of bilateral, US carriers should offer similar service.

Soviet seismologists record shockwaves emanating from American Mid-West, and denounce such unauthorized nuclear testing. It transpires that cause is the collapse of Mount Cheyenne, which for ten years has been increasingly hollowed out to house underground combat operations centre of NORAD. Idea was to make it withstand overpressure from thermonuclear fireball touching mountain. Unfortunately, need to provide staterooms for 167 additional generals and 94 senators, with dependents, so weakened structure that it gave way when B-70 flew overhead.

Members of International Air-Traffic Control Association, having arrived by boat and train at conference headquarters in New York fallout shelter, reach unanimous agreement on surprise motion which solves their problems. Military authorities will control military aircraft and missiles, and civil authorities will control civil aircraft. Interchange of information between the two groups is to be discouraged, to avoid distracting controllers.

Marksman, the MMRBM (mobile medium-range ballistic missile) sponsored in 1961 for NATO use, remains in service only with army of Prince U Bin Puppet, whose kingdom has now shrunk to 36 square miles of Southern Viet Phong. Chief reason for withdrawal from Europe was high attrition rate. In one recent month in Germany alone, 14 were destroyed in road accidents and six mistakenly hi-jacked. It also proved unpopular with civil authorities, who could only levy standard fines for parking offences. Marksman of French army which vanished with its crew in 1965 is thought to be in Algerian quarter of Paris.

OCTOBER

Nine US Air Force generals are arrested by British police during sit-down demonstration in front of offices of Committee of 1,000,000. At Cannon Row police station, Gen "Tiny" Vastenvich says, "I came over all peaceful . . . like I wanted to demonstrate it to someone." Generals are released, while police on duty cry softly.

Seven underwriters on the London market are bankrupted by careless driver of fork-lift truck at Umguli Junction, in Mid-African Federation. Under influence of kaffir beer, he collides with undersurface of port wing of first BOAC UST-5C supersonic transport, causing damage provisionally assessed at £6,980,000.00.

UN relief is hurriedly airlifted to over 800 RAF personnel cut off for 19 weeks in Ombo-Bongoland by infuriated tribesmen. Cause of dispute is a rumour that RAF are being unfair in supplying communities cut off by floods.

NOVEMBER

Hearings before FAA, PNYA, IFALPA and DOD to ascertain how 121,707,880 windows throughout Greater New York came to be broken at 0317hr on November 19, in sub-zero weather, produce no conclusive evidence. PanAm "Royal Orbit" 112-minute service to Paris, due to leave at 0300 on that day, was delayed 44hr by malfunction of port wing-droop latch. Capt Yuri Malefaktov (Aeroflot) says "In accordance with Party instructions I always apply myself diligently to the accurate handling of my glorious aircraft; and so, you must agree, I could not have been responsible." Capt Basil Strattonhouse (BOAC) says "Her Majesty's Vice-Consul strongly advises me not to say anything at present; and anyway my first officer was in control at the time." Only aircraft known to have been over Manhattan when disaster occurred was an S-67B of New York Airways; and assertion of its pilot, from Sing Sing, "Aw shucks, my chopper's windows were broken too," is not regarded as proof of innocence.

National Coal Board receives advance of £917,000,000.00 "to help meet the industry's increasing deficit." Plea by Admiralty for £5,825.75 to finance study by HSA into reusable version of Seaslug 3 is rejected by Treasury, who say they would be prepared to consider study into coal-burning version.

British Health Service is awarded supplementary vote of £365,000,000.00. Ministry of Aviation agree to finance new BAC noiseless supersonic transport to extent of £2,500.00, provided money is recovered, plus 6½ per cent interest, by levy on all sales.

DECEMBER

"Flight" receives plain white card from HM Treasury, which states "The Chancellor of The Exchequer is not sending Christmas cards this year. Instead he has sanctioned the expenditure of £16.50 to be shared between the Air Ministry and Ministry of Aviation in support of a number of the most deserving new projects." . . . Chancellor receives striking Christmas card from "Flight," featuring impressionist gouache of Dorset House in low Earth orbit, accompanied by subscription order form. After pondering various witty replies he decides not to reply at all, in view of need to curtail public expenditure. . . . Editor of "Flight" receives filled-in subscription order form from Chancellor, together with supplementary demand under Schedule D amounting to £125.

Messrs Kennedy and Krushchev hold Summit talks at Moonbase No 5 (Sea of Tranquility). Meanwhile, London newspaper publishes report that US has "stolen the Barnes Wallis Swallow." House of Lords debates wisdom of decision to cancel Blue Streak as military weapon. "Shadow" Defence Minister claims Blue Steel Mk 8 is in development trouble. HM Comptroller-General continues investigation into financing of Swift and Princess. Minister of Aviation departs for Isle of Wight to attempt export order for SR.177. Editor of *Flight* wades knee-deep through letters denying that the Hon Algernon Crump-Bashley wore spurs while flying his hydroplane from Metropolitan Water Board reservoir at Ponders End in 1908.

Minister of Aviation announces "The aircraft industry of this country still has a part to play. In fact, I would go so far as to say that it has a future."

Former aircraft designers and their families listening to the Minister of Aviation's speech at their annual reunion and garden party. This gay occasion is always held during the first week in September, at the Royal Aeronautical Museum at Farnborough

FUNCTIONING NORMALLY EACH WEEK IN ACCORD ANCE WITH THE PLANNED PROGRAMME

SOVIETSKI
AEROPLAN
Ж ASTRONAVTIKA

Issue of December 25, 1984, commemorating 23rd year of glorious five-year plan and anniversary of glorious October orbital revolution

FIRST LANDING ON MARS BY SOVIET AUTOMATIC INTERPLANETARY STATION CARRYING NUMEROUS BIOLOGICAL SPECIMENS INCLUDING ANIMALS DEMONSTRATES SUPERIORITY OF SOCIALIST SYSTEM AND IS ACCLAIMED BY FREEDOM-LOVING GOVERNMENTS THROUGHOUT THE WORLD

In accordance with the planned programme of scientific research, an automatic interplanetary station was launched in the Soviet Union on December 15, 1984.

For medical-biological research in the conditions of space flight an experimental dog has been placed in the cabin of the automatic interplanetary station. In the cabin there are other animals, insects, plants and biological specimens.

The experimental animals are being observed by means of radio-television apparatus and telemetric systems, which play back objective physiological data characterizing the state of the animals.

The scientific measuring instrumentation installed in the automatic interplanetary station provides for a number of scientific investigations of outer-space physics.

According to the available preliminary data all the instrumentation on board the automatic interplanetary station is functioning normally.

In accordance with the planned programme, a landing on the planet Mars was made by the automatic interplanetary station.

PSEUDO-JOURNALIST SPIES EXPELLED FROM MOSCOW

Doubts Cast on Authenticity of Gagarov Film
Accusation of Deception Completely Without Foundation

The Moscow correspondents of two Western-bloc aviation publications, "Rockets and Fizzles" (USA) and "Might" (UK), have been ordered to leave the Soviet Union forthwith.

The two journalists had been found guilty of (1) attempted espionage and (2) the more serious charge of commenting unfavourably on a film concerning a Soviet cosmonaut entitled "Yet Again to the Stars with Gagarov."

The pseudo-journalist agents had cast doubts on the authenticity of one particular sequence in the film concerning Gagarov. After two weeks in an isolation chamber during training, the cosmonaut begins to recite verses by Pushkin. The "Rockets and Fizzles" agent alleges the verses to be by Ogden Nash, while according to "Might" they are by Dylan Thomas.

This accusation of attempted deception is naturally completely without foundation.

The two Westerners also criticized the authenticity of the rocket launch sequences in the film, implying that an amount of information was concealed. The absurdity of this is shown in the unretouched photograph on this page, which is taken from the film.

MOSCOW PRESS CONFERENCE WITH HUNDREDTH SOVIET COSMONAUT, LIEUTENANT HERMAN YURI GAGAROV, STRESSES ROLE OF CENTRAL GOVERNMENT AND INSPIRATION OF PARTY IN ACHIEVING GLORIOUS TRIUMPH FOR SOCIALISM AND COMMUNISM

When did the launch take place?—The launch took place in accordance with the planned programme at the specified time.

How long were you in orbit?—The characteristics of the flight were selected to provide the appropriate parameters. Duration of flight, naturally, was one of these parameters.

How large was the spacecraft?—The spaceship, naturally, was large enough to permit the planned programme to be accomplished in the requisite manner.

How long did you have to prepare for the flight?—I was naturally informed in advance that the flight would take place. I was given sufficient time to complete the necessary preparations.

Was the descent made on to land or into the ocean?—Both are possible.

What method of descent was used?—It is possible to descend inside the cabin of the spaceship. It is also possible to descend by parachute separately from the spaceship, outside the spaceship. On this occasion it was carried out in the following manner. First, I made the signal to command the descent. Then, the descent was accomplished in accordance with the planned programme.

What were you thinking during the re-entry period, when your spaceship must have become red-hot?—I knew, naturally, that nothing would go wrong. I was thinking that, if anything did go wrong, I should simply report my situation to the Central Government, who would be ready to help me at all times. I was thinking of the party.

Why were you thinking of the party?—Because it was a good party, especially after they brought in the extra case

Clear details of Gagarov's launch rocket are seen in this excellent photograph

of Vodka. Also, because my wife was not there, I was able to cultivate the friendship of that personable young blonde who drives the crash truck at the launch site. In fact, in accordance with my planned programme, we actually—

Academician Flagonblastov: What Cosmonaut Gagarov is stating is that he is ready to accomplish any exploit for the sake of the might and prosperity of our beloved homeland, to the glory of our country, to the glory of our people.

Gagarov: Long live our socialist motherland, naturally.

What were your thoughts immediately before the launch?—I dedicated my flight through space to the 45th Congress of the Cosmonautical Section of the Party. I thought, naturally, that the effort and valorous exploits of millions of workers, collective farmers and intellectuals, of the entire Soviet people, and of the peoples of the world, were embodied in the glorious accomplishments of the scientists, engineers, technicians and workers who put all their knowledge and heart into the development of the spaceship.

As I walked to the launch tower, I looked at the familiar countryside, my cheerful colleagues, the multi-stage rocket that was to carry me into the cosmos, the artificial rockets made of cardboard used in the many great films that have been made of previous space flights, the vast cemetery where lie our many glorious canines who perished in the pioneering days BG (Before Gagarin) when many unsuccessful flights were made, the recording studio building where, only a few days previously, I had recorded my landing and post-flight impressions of the flight I was about to make, the false—

Academician Flagonblastov: What ex-cosmonaut Gagarov is stating is that he dedicated his flight through space to the 45th Congress of the Cosmonautical Section of the Party, and that he wishes very much that he had time to answer further questions.

WITH MY DELEGATION TO THE HOME OF CAPITALISM

Impressions of a Not Very Extensive Visit to the Recent Astronautical Conference in the United States of America

BY ACADEMICIAN L. REDOV

It was very interesting for my delegation comrades and I to visit the United States of America to attend the international astronautical conference which was held in that country at a recent date.

Of the technical matters I shall not speak here, since I believe that it will be very interesting for readers if I tell instead about the social customs of this country.

The first interesting thing is that Americans do not live in houses, as we do in our country, but in strange communities known as "motels" or "motor hotels." The motor hotels, strangely, are not for motors but for people.

The astronautical congress was held in one of these motor hotels. The downtrodden working classes ate their food in an overheated restaurant called the Hot Shoppe, while the upper-class bosses ate in a heavily guarded secret place known as the Sirloin 'n' Saddle Room.

The community possessed a superficial air of decadent luxury, but the people were unable to afford alcoholic beverages. This they attributed to Virginia Statelaw, whoever that lady might be. In only one heavily guarded secret place, known as the Windjammer Club, was the drinking of alcoholic beverages possible—but only for the millionaire bosses.

The state of the capitalist aircraft and space industry is very interesting. It is staffed entirely by women, all the men having been conscripted into the military forces to prepare for attack on the peaceful nations of the socialist-communist bloc.

It is obvious that the industry is staffed entirely by women from the many photographs of new products which appear in the press: in all these photographs there is a young and by western standards handsome woman worker who has clearly just completed manufacturing the product shown.

Furthermore, it is interesting that the weather must be very warm in that part of the country where the industry is located since the women workers in many of the photographs are not burdened byheavy clothing. Some of them, furthermore, are clearly unable to afford proper clothes at all and are forced to work only in what one might describe as the bare minimum.

Throughout the entire area of the nation and throughout the day and night one hears continuous slow music, American in origin and depressing in its effect, which is clearly intended to make the downtrodden masses forget the misery of their everyday existence.

Surprisingly absent from the records on sale in the record shops were the Soviet cosmonaut series of long-playing records entitled "Into Space with Gagarin," "Into Space with Titov," etc, etc. According to a capitalist journal the most popular record in the country at that time was entitled "Bowl Your Way to Better French Thru Civil War Bird Calls in Hi-Fi with Thelonius Monk Playing Chico Hamilton's Songs for Swinging Felons."

I think America is a very interesting country.

SOMEWHAT LESS EXTENSIVE ITEMS OF INFORMATION WHICH WILL BE INTERESTING TO OUR READERS

FRATERNAL CONGRATULATION

The Soviet Premier has transmitted a fraternal message of congratulation to the Ethiopian Collectivists on their recent successful heavy satellite launching.

WARMONGERING PRINCIPLES

The United States of America, in conformity with its warmongering capitalist dictatorship principles is expanding its existing ballistic missile base at Houston, Texas, under guise of peaceful space exploration.

FRIENDLY GREETINGS

N. S. Kruschov has forwarded a message of warm and friendly greetings on the occasion of the opening of the London Conference of United Kingdom Space Committees and Associated Advisory and Non-regulatory Bodies.

MILITARISTIC ALLIANCE

A militaristic Celtic alliance has been formed with the specific intention of attacking the freedom-loving Soviets. A ballistic missile base is expected to be operational in the near future at Llangollen Air Force Base.

PLANETARY VIOLATION

A ballistic missile base has been established on an unspecified planet of the solar system by officers and men of the Hatfield Manpowered Spacecraft Missile System Command of the Royal Air Force.

COSMONAUTICAL CONGRESS UNANIMOUSLY AFFIRMS SPIRIT OF LOYALTY TO MARXISM-LENINISM AND OF IMPLACABILITY TOWARDS EVERY MANIFESTATION OF BOURGEOIS IDEOLOGY

Declares Vigorous Struggle to be Conducted Against Revisionism, Dogmatism and Sectarianism in Outer Space

The 27th Congress of the Cosmonautical Section of the Communist Party of the Soviet Union, which opened on May 5, ended in the Palace of Congresses of the Kremlin on December 20. The congress was attended by over 4,800 delegates representing over 9,700,000 members and candidate members of the C.S.C.P.S.U.

In an atmosphere of complete unanimity, the congress adopted the new C.S.C.P.S.U. programme for building communist societies in the non-aligned people's planets, and also approved the new party rules (vodka supplies to be restricted for factionalist group activists).

Tumultuous applause greeted the announcement by Y. U. Liftov, chairman of the central committee's Institute of Astro-Marxism-Leninism, that "The resentful howling of our enemies betray nothing but the animal fear of the powerful march of history, of the measured tread of the undaunted ranks of labour and of the grand and feasible prospect of mankind's irresistible onward movement into the cosmos.

"At this great turning point in history some miserable outcasts, who style themselves Marxonauts, have launched despicable and slanderous anti-Leninist attacks against our programme. I am referring to the Albanian leaders and the chief ideologist of the anti-party (or 'Kiljoi') group, Molotosh."

After a unanimous resolution denouncing the factional struggle waged by the anti-party renegades and declaring the congress's undeviating intention to render every assistance to peoples fighting for their liberation from imperialist and colonial oppression and for the strengthening of their independence, . overwhelming and tumultuous applause and cries of "Death to Fascist monopolistic hyenas, imperialist warmongers and capitalist dictators" greeted the final exposure by Liftov of the latest anti-communist smear campaign.

"It is palpably ridiculous for these reactionary chauvinists to claim," he said, "that we have in our scientific programme any element of political bias."

STOP PRESS

(Latest news, made possible by glorious advances in Soviet printing technology)

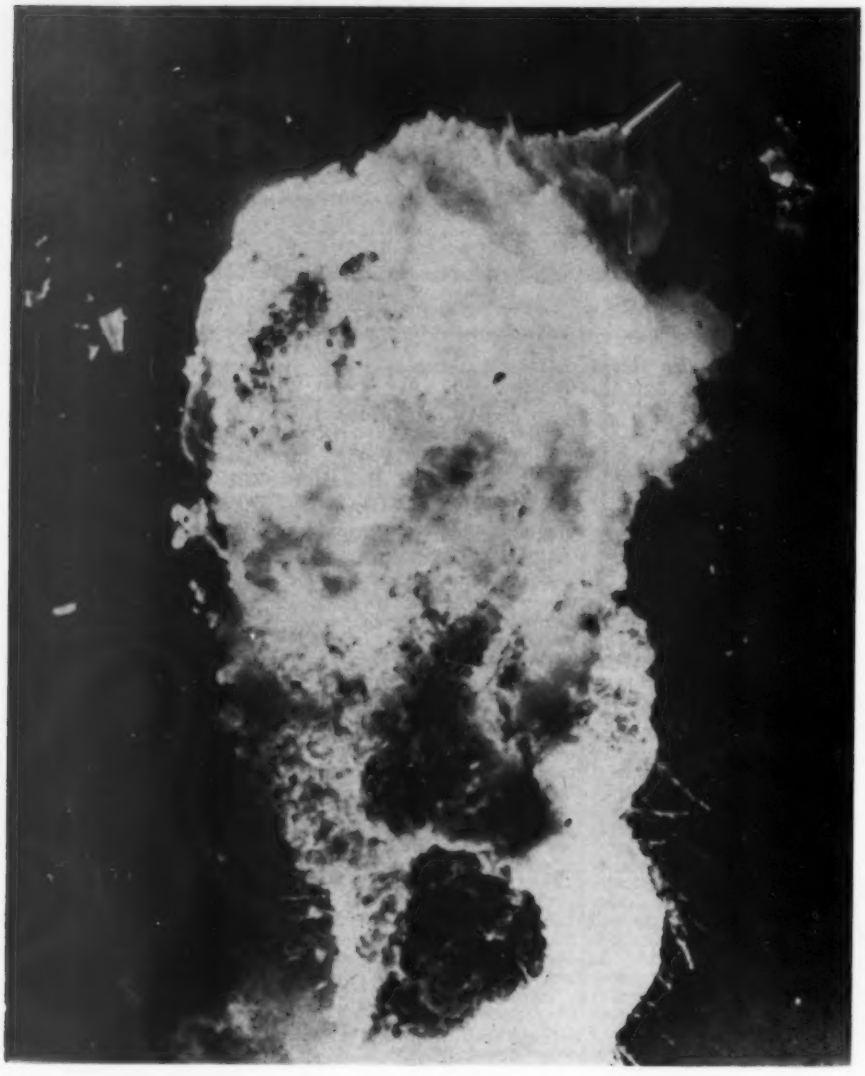
American Astronomical Talking Observatory a Threat to World Peace and Occupants of Cocoa Beach, Says Soviet Premier

A new military space weapon was unsuccessfully tested by the Western-bloc reactionaries in Florida on December 21. Designed to attack Soviet cities after completing a figure-of-'eight' interga!actic trajectory, and capable of transmitting the most powerful (50 megablurb %?dvisdshrlductaom !epyco g) by the Madison Avenue warmongers, the missile launch was deservedly a failure.

rockets and fizzles

THE MISSILE / SPACE WEAKLY

December 25, 1984



Soviet Marscraft Shows Red Lead—Congressional Hearings Slated

- Gagarov Slashes US
- Congress Shows Red Lead
- British Still Talking

Launch-pad scene at Cape Canaveral Wednesday, when intergalactic figure-of-eight trajectory shot was made. Air Force later called shot only partial success. R/F can now reveal cause:— something went wrong

Countdown Newsbriefs

New Goal

Next major national US goal to be recommended President Kennedy by top-line advisory group will be major mission—to place Soviet Union on Moon before end of decade. Watch out for Lunar Technology Center to be set up at Houston, Tex.

Intergalactic

Astronomical Talking Observatory with meteorologicommunicationavigational capability was launched into figure-of-eight intergalactic trajectory from Cape Canaveral Wednesday. "Had it left the pad, we would have had those lousy reds licked," commented Gen Slickinger.

Big Move

In major reorganization of national economy, sources state, United Nations Building, White House, Capitol Hill and Massachusetts Institute of Technology are slated to be moved to Houston, Tex.

Talk

"Britain can talk it" seems to be the keynote of the tight little isle's space programme. As latest committee formed to co-ordinate other committees' space-type work, 25th anniversary celebrations planned in honor of country's Very First Space Committee. More money will be voted for this celebration, sources state, than for all the 25 years of the British space programme to date. Much of limey science, traditionally, is carried out by amateurs, who carry on typical jobs such as beefeating while not steering mighty radio telescopes, chairing committees etc.

Address

Vice-president scheduled to address hometown audience at Houston, Tex, Friday.

Unprovoked Attack . . .

Gagarov Slashes US at Red Press Parley —Also Shows Red Lead

FIERCE CRITICISM of the United States was a feature of Red spaceman Herman Yuri Gagarov's press conference in Moscow Tuesday. The Soviet cosmonaut spoke of his country's "planned program," "appropriate parameters" and "sufficient time for preparation," clearly and aggressively lamming the US for a lack of planning, inappropriate parameters, and insufficient time for preparation.

More serious, even, than this bitter and unprovoked attack were the Red space flyer's remarks about Soviet celebrative capability. Vodka, he said, is unbeatable.

Swift reaction-time and multimegaton punch of this intercontinental weapon were already known to Western planners and defense chiefs, but its effectiveness on launch-pad crash-truck mobility, quoted by Gagarov, now confirms Red lead in new space field.

Pressure is now mounting in Washington for additional funds and top priority to be allocated OCB satellite project. Orbiting Cocktail Bar would dispense American-type drinks from stationary orbit over Moscow, inebriate Reds, hence regain US lead.

Soviet Marscraft Shows Red Lead

Congressional Hearings Begin Tonite—Canine Space Center Slated for Houston, Tex

THE HOUSE Space Services and Canine Investigating Subcommittee is digging into charges that the latest revision of the Air Force procurement program for missiles in FY'84 ignores the capability implication of the Soviet Union's reported landing on Mars, a planet.

USAF generals are now demanding crash program on OBC satellite project. Orbiting Barking Canine would set up multi-decibel howling throughout ionosphere, interfere with Red communications with Marsdog, hence regain US lead.

Meanwhile, the Kennedy Administration is under pressure to set up a new space technology facility with a specifically canine capability.

Location for the dog-base? Capitol Hill sources tip Houston, Tex as the selected spot, for the usual reasons.

TINY ROCKET (above) held by pretty Dorothy Dalla Torre (right) is matched against Mercury-Redstone man-carrying booster; will be used (the tiny rocket, not Miss Torre) to control flight of spacecraft

LUNAR ROVERS Porkie and Dumbo are given detailed inspect by Judith Wrona, pretty American Rocket Society secretary. Judith has worked for pretty American Rocket Society for some time now

SADDLE-ITE IN ORBIT: Pretty Deanne Martin of Silver Springs, Fla, recently made her first flight aboard powerful Navaho missile, important contribution to Free World deterrent system capability posture

Soviet Congress Shows Red Lead

SO-CALLED Cosmonaut Congress held last month in Moscow, Russia, is reliably believed by top intelligencers to have been skilful cover-up for massive bidders' conference for Red industry on upcoming new project. Proposals were outlined, sources report, for massive pilotless missiles, equipped with sophisticated electronic devices capable of giving impression to Free-World early-warning system of missile-less pilots, hence baffling NORAD button-pressers and precipitating nervous breakdowns, with subsequent heavy demand on USAF psychiatric capability.

Red Scientist Slams Free-World Posture

WRITING in current issue of *Sovietski Aeroplan & Astronautika*, Soviet Prof L. Redov blasts recent world space meet hosted by US. Main criticism? Bad food, no drink, inferior music.

Interior luxury of top-class, exclusive motor hotel housing space meet is dubbed "decadent" by the eminent Red scientist. Top-ten discs, likewise, strike kingsize dull note.

Among many aggressive claims made by the Communist professor is the ridiculous idea that US aerospace publicity material features girls rather than serious products.

How hysterical can you get?

MUSCULAR ARMS of Mobot Mark 2 mobile robot built by Hughes Aircraft Company, Culver City, Cal, embrace pretty Colleen Adams in a demonstration of almost-human actions. The remote-controlled handling machine was designed to substitute for man in dangerous places. Mobot boasts double-jointed shoulders, elbows and wrists, soft padded hands providing a light touch, and TV-camera "eyes" to transmit pictures of its handiwork to a human operator at a remote control console

Issue of December 25, 1984

Soviet Cruelty to Space-dog

SPACESHIP CABIN FIT ONLY FOR AN ASTRONAUT, ALLEGES MP

SCENES of uproar at Westminster last night greeted the announcement by the Prime Minister in the Commons that "There is every indication to believe, notwithstanding certain reports to the contrary, that in a number of respects the design of the space vehicle constructed, we understand, by the Soviet Union and which, we are reliably informed, journeyed to the vicinity of Mars, a planet, falls to a certain extent somewhat short of the standards which might reasonably, according to Her Majesty's Government's advice, be considered, as a general rule, and without prejudice to subsequent decisions taken in another place which might, or indeed might not, be adjudged to be relevant to the matter under discussion, subject to possible negotiations with our friends in the United States and our friends in the Europe community, to be possibly applicable in assessing the viable criteria of reasonableness, having regard to the health, comfort and freedom of thought and action of the individual canine concerned, which might be considered to be applicable within the meaning of the Act, to those animals, the love and affection for whom is the foundation of this great commonwealth of nations of which we are all so proud—notwithstanding our full intention, given the requisite safeguards, to consider in all respects the possibility of our considering what might be regarded as a somewhat closer, or at least somewhat perhaps not quite so distant, provisional association with our European friends—those animals, furthermore, which typify all that is best in the national character, known as dogs.

"In this matter, if the House will permit the phrase, we intend to go forward together with a dogged determination."

As the Prime Minister was speaking, thousands of angry dog-lovers were demonstrating in Trafalgar Square, carrying placards reading "We love angry dogs" and "Russians Barking up Wrong Tree, Say South Kensington Conservative Ladies' League." All-night sittings for tonight are planned by the House of Commons, House of Lords, and the South Kensington Conservative Ladies' League.

BRITAIN'S LEAD ASSURED

Manpowered Spacecraft

ON DECEMBER 10 the Hatfield Manpowered Spacecraft Club issued a Press announcement which stated:

"The Hatfield Manpowered Spacecraft Club today issued a Press announcement which states:

"It is announced by the Hatfield Manpowered Spacecraft Club that a manpowered spacecraft with which the Club has been to a certain extent connected has completed a flight which is in certain respects to be considered as being successful.

"The spacecraft effected a landing on a planet other than Earth.

"Further details will be issued to the Press in a subsequent announcement at the appropriate time."

Asked which planet was involved, the chief designer of the HMSC refused to divulge operational details which might be of use to the competing manpowered spacecraft group at Southampton.

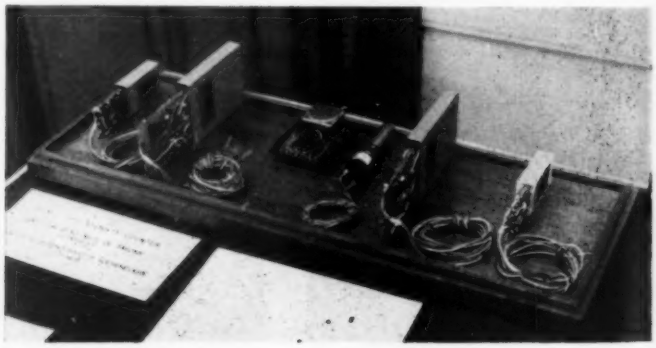
GREATEST-EVER FARNBOROUGH

PLANS for next year's Society of British Spacecraft Constructors exhibition at Farnborough indicate that it will be the best show yet. More companies are exhibiting than ever before, and the number of feasibility studies and publicity brochures which will be statically exhibited cover a much greater range.

The company enclosures this year will contain larger cocktail bars and more-lavish food and waitresses than ever before. The enclosures will cover a greater area, and will in fact extend over all the airfield's runways.

Since no actual spacecraft will be involved, this lack of runway availability is "not disadvantageous," the Society states.

BRITAIN'S mighty Skylark heavy launcher (left) is the backbone of this country's massive space programme. Main advantage of the new launch technique here illustrated is its economy, admittedly not a very significant factor for a major power such as Great Britain but one which permits a greater number of satellites to be launched per day. Below, typical payload for heavy orbiting observatory illustrates Britain's lead in genuine old-oak base-boards for a variety of missions



MOST SOPHISTICATED SATELLITE

Britain's Lead Described by Minister for Science

SPEAKING in the House of Lords on December 6, the Minister for Science said "My Lords, I should now like to turn, if I may, to the first British satellite experiments, which were authorized by the Cabinet only 25 years ago and which I am now hoping will shortly come to fruition . . .

"It is flattering to be told by the Americans that they regard the payload of our first joint Scout satellite as perhaps one of the most sophisticated of first joint satellites of this name ever to come from this country."

HERM HAILS BRITISH BOOST FOR SOVIET SPACE SUCCESS

A GENEROUS tribute to Britain's role in the recent Soviet manned spacecraft event was paid in Moscow yesterday by Lt Herman Yuri Gagarov—Herm to all his British fans—at a mammoth press conference. After the mammoths had finished answering questions it was the smiling Herm's turn.

The "effort and valorous exploits" of millions of Britons (and assistance from other countries of the world) was specifically acknowledged by the smiling, handsome hero. Pressed to give further details of the British contribution, he smilingly, handsomely declined.

BRITAIN'S SPACE LEAD CONFIRMED BY SOVIET UNION

A BRITISH delegation of observers to the 27th Congress of the Soviet Academy of Cosmonauts in Moscow returned to this country on December 21. The leader of the delegation, Sir Erptitious Waffle, said at London Airport; "It was a most interesting conference, though not as well-organized as the first meeting last week of the new Provisional Joint Interim Steering Committee in London. I am sure that, by and large, our meetings on space affairs are superior to those of any other country."

EUROPE'S LEAD in female astronauts: Left, elegant Brenda Horsfield models leopard-skin windcheater and purple ski trousers prior to Tiger-boosted launch in manœuvrable space glider; right, unidentified French astronette prepares for take-off in Nord CT.20 woman-carrying spacecraft

Leading Booster for British Payload

THE National Aeronautics and Space Administration announced last week that the massive five-stage Nova rocket would be used to place the first joint Anglo-American satellite in orbit. Originally planned to be launched by the somewhat smaller Scout rocket, then by the medium-sized Delta, then by Atlas-Centaur, then by two-stage Saturn, then by three-stage Saturn, the sophisticated British satellite is expected to reveal important new information on the first quarter-mile of the D layer of the ionosphere.

The Nova vehicle employs five 1.5mlb thrust F-1 engines as first stage, two 1.5mlb thrust F-1 engines as second stage, and upper stages developing a total thrust of 920,000lb. Total thrust of Scout was 182,000lb.

Weight of the British scientists' instruments was originally 150lb, but it is believed that this payload weight has perhaps increased slightly during the 25-year development period. An orbit of 100-200 miles is planned.

"As my father said when he made the change from Scout to Delta rocket," a NASA official stated, "—and on all those other occasions, too—we are convinced of the mutual benefits to be obtained by means of co-operative efforts on an international basis."

IN BRIEF ALL QUARTERS FROM MOMENTOUS MATTERS NEWS

New Committee Formed. A new Joint Steering Space Advisory Committee is to be formed to co-ordinate the work of the 73 existing space committees in the United Kingdom. This heartening news was given at the opening session of the 25th annual Conference of United Kingdom Space Committees and Associated Advisory and Non-regulatory Astronautical Bodies, in London last week.

* * *

Britain Might Lose Lead. Speaking before the aeronautical group of the Loyal Astronautical Society on Tuesday of last week, the Minister of Aviation stated that, if this country did not pay attention to "certain factors," Britain might very nearly almost reach the position where she might conceivably seem to be in possible danger of perhaps losing her world lead in space.

* * *

European Space Milestone. The first Provisional Draft Interim Agreement for the possible formation of a European Space Launch Vehicle Development Organization reached a milestone in its history on December 15, when the agenda for a new phase of preliminary negotiations was agreed in principle by delegates from 28 of the 59 member countries. It is now considered almost probable that Monaco will build the twelfth stage of the vehicle. As for the *upper* stages, these are still in doubt.

* * *

US Cruelty to Soviet Dog. The Foreign Secretary is to be asked at Question Time in the Commons today "Whether Her Majesty's Government is aware that the needles launched into space by the Americans are causing unnecessary cruelty to the most recent dog launched into space by the Russians; whether this is not a suitable occasion for the traditional British spirit of compromise and fair play to assert itself; and, if not, what Her Majesty's Government plans to do about the situation, bearing in mind the implications of the impact of the European Common Market on the Chorley needle-holing industry.

* * *

Celtospace Formed. Wales, Scotland and Ireland are to combine in a joint space endeavour which will have as its first main objective the organization of a five-stage *Eisteddfod yr Space Mawr* at Llangollen. A spokesman for the planning group stated "This is a truly international effort if we exclude, as we most certainly shall, isn't it, those ignorant natives from England. We seek to combine the best elements of an Irish tenor, Welsh harp and Scots bagpipes, and to place the whole lot in orbit. There's genius for you, man, och aye, begorrah."

* * *

Britain in Space? The British Interplanetary Association has called for an all-out effort to place the Minister of Aviation in orbit.

Straight and Level

A MERRY Christmas and a Happy and Prosperous New Year to you all.

Usually the Christmas edition of Straight and Level is devoted to a selection of the many kind and entirely unsolicited messages addressed to me by Top People in British aviation. This year, most unfortunately, my p.r.o. was taken ill soon after he had started drafting them, so they will not be appearing.

However, the seasonal workload has been considerably lightened by heavy utilization of our Seasonal Greetings Simulator Mk 2 and our Mobile Cocktail Party Unit, and I can offer (1) an advertising handout to help you with your Christmas shopping, and (2) an excerpt from the pantomime, "A Christmas Diversion," which opened at the Air Power Theatre last week.

Somebody's Christmas present to Rear Admiral Noel Gayler (left), US naval attaché in London, was a table shaped like an aircraft carrier. It prompted me to dream up table shapes suitable for other top people. How about steadily contracting tables for aircraft-industry managing directors? Or a steeply declining one for the Minister of Aviation? Or a table-shaped table for Parliamentary select committees? Anybody got any other ideas?

What To Give Him

Is there a man in your life? Let Flight Falsies Ltd provide the answers to your Christmas present problems.

For the independent pilot: A pair of handsome navy blue gumboots with four gold rings around each for wearing on the chicken farm. Chic enough, too, for hero-walking down the cabin.

For Mr Peter Thorneycroft, Minister of Aviation: A box of toy bricks for playing Mergers. Each brick marked with the name of a British aircraft company or independent airline.

For the man on the Air Transport Licensing Board: A tin of Material Diversion, a specially blended soporific for use during boring hearings.

For Mr Harold Bamberg, chairman of Cunard Eagle: Monopoly—the old game with a new twist. Even more original, a long-playing gramophone record by Mister Acker Bilk of that ever popular trad: "They must not undermine the corporations' competitive positions." On the other side: "BOAC has adequate aircraft capacity." Sung by a massed choir of teenage appeal commissioners, and likely to remain in the Top Ten for years more.

Finally, for the booklover, an autographed copy of *No Comment*, a novel by Dr J. Nit that all the smartest people in the Ministry are reading. [Young, handsome John Shelver, MoP, has a safe, even a brilliant career in politics before him. But can he stop those dreadful lemonade advertisements—huge hoardings 60ft high, and imitation bottles—going up at London (Benbecula) Airport?] This gripping story of a good man's struggle for his soul among the brutalising commercial influences of modern air transport has attracted rave notices from all the reviewers.

A Christmas Diversion

Scene: Terrace of the Imperial British Air Power Club's country home, Fredscaff Hall, near London Heathwick Airport. Deafening roar as inaugural Press flight of Scruggs Wonderplane takes off, narrowly missing flagpole in front of golf-club pavilion.

Cast (in order of appearance):—

Sir Charles Boost, prince of British air power and fount of all prestige.
Sir John Blackout-Jones, chairman, Scruggs Aircraft Ltd.
Rt Hon Mr Hugh Strangeways, Minister of Planes.
Lady Boost.
Daphne Dormouse, 36-24-36.
Sir Fred Knocking, chairman, Potters Bar United Airways.

SIR CHARLES BOOST [*as the noise dies away*]: . . . and what a splendid tribute to our native British design genius, eh? Here's to you, Blackie, my dear fellow. You are a good chap and a genius.

SIR JOHN BLACKOUT-JONES: Team-work, old boy. I didn't do anything, except get you to find the money, eh Minister?

MR HUGH STRANGEWAYS: Did I agree to pay for that? I must have been crazy.

LADY BOOST: Hugh, you naughty man. You don't speak like that in Parliament.

STRANGEWAYS: Rubbish, my dear lady. What could have been more outspoken than my reply yesterday to that question about swashbuckles?

DAPHNE DORMOUSE: Swashbuckles?

STRANGEWAYS: Yes, swashbuckles. The hon Member for Nurkby asked me whether I would state the number of independent airline pilots who are spare-time Christmas-tree growers and who wear swashbuckles when flying.

SIR CHARLES: What we want is more swashbuckling in British aviation and less of all this cost per seat-ton nonsense.

LADY BOOST: Oh Boostie, do come off it. What did you say to him, Hugh?

MR STRANGEWAYS [*doubling up with laughter and spilling Sir Fred Knocking's drink*]: I just said "No, sir." [*Renewed laughter.*]

SIR FRED KNOCKING: You've spilt my drink.

LADY BOOST: Don't look at the Minister like that, Knockers. He'll hold a piece of mistletoe over you and Chorley Wood Airways if you're not nicer to him.

SIR CHARLES: Hugh, old boy, what about all these damned foreign airlines being fixed up with millions of British passengers by British travel agents? Bad show, you know. How many private British airlines have you clobbered this week, eh?

STRANGEWAYS: I got a brace or two this morning. It's been rather a good year for them.

SIR JOHN: It's coming back!

SIR CHARLES: What is? Oh crikey, the wing—the wing shouldn't be like that!

SIR JOHN [*nervously munching holly berries*]: What do you think Press flights are for?

DAPHNE DORMOUSE: Oooh, it's coming straight for us.

[*Scruggs Wonderplane crash-lands on terrace of Imperial British Air Power Club. Pilot opens d.v. panel.*]

SIR JOHN: Pilot error, a clear case.

PILOT: My only error was not to land on top of you lot, mate.

LADY BOOST: Boostie, do give all those poor journalists a drink. I say, who is that tall, dark handsome young man? It can't be! It *is*! It's . . .

ROGER BACON

"... it was probable that the hedge would be topped with a row of trees." Capt Neale's Avro, photographed at Bristol in 1922

THE writer of this article will be remembered as the originator, some 30 years ago, of a highly unconventional aircraft which later became known as the Warren-Young and which re-appeared in 1945 as a project named the Warren-Young Skycar. With the object of eliminating stalling, the swept-back wings were joined by semicircular tip surfaces to swept-forward rear wings. Mr Warren-Young, who has been a senior aerodynamicist with several well-known constructors, has in recent years worked on a third version of his design. Here, however, he nostalgically recalls his very earliest contacts with aviation.

The Barnstormers

By NORMAN HALL-WARREN, ARAeS

"CONTACT." An airscrew blade whipped into view and the Avro 504 shuddered as the rotary engine kicked back on compression. The pilot thumbed the tumbler switch and called "switch off." The mechanic grasped the airscrew and proceeded to turn the engine over compression. From the back seat I looked forward past the pilot's helmeted head and watched the mechanic turn the airscrew round; it moved spasmodically as he strained against the compression of each cylinder. The exhaust valves opened and expelled the gas with throaty chunking sounds. A lark sang overhead, and the breeze sighed in the bracing wires.

"Contact," called the mechanic; the pilot switched on and replied "Contact." The engine started with the characteristic clatter of a rotary, a cloud of sweet-smelling castor oil blew back on us and the Avro vibrated with life. The mechanic pulled away the chocks, the pilot pushed forward the throttle lever and the aeroplane moved off, swaying as its wheels rumbled over the uneven grass field. I felt the tail come up as we gained speed, a deafening roar blasted from the open exhausts, the slipstream buffeted my face with increasing power; but still we swayed and bumped, the hedge rushing towards us. Then, at last, a floating feeling—we were off.

The hedge flashed underneath, trees swept past and downward, dwindling to model size, ribbon-like roads wound through a patchwork of fields to converge on the city, which soon passed slowly beneath our wings. My eyes, screwed up against the whipping slipstream, ranged around the horizon, a circle framed by the wings and interplane struts, criss-crossed by vibrating bracing wires. We banked gently over map-like rows of roof-tops, which passed unrecognizably two thousand feet below. I felt my seat pressing up and falling away from me as we rose and fell in the air currents.

All too soon the clatter of the engine decreased, the line of the horizon rose above the engine cowling and our landing field came into view. We passed it at a hundred feet or so and, banking steeply, saw it rotate about our wing-tips. The hedge swept towards us and passed underneath; a jolt shook the aeroplane, followed by a noisy flexing of the undercarriage. We were back to earth.

This was my first flight, the culmination of years of dreaming. I was sixteen years of age. My mood ecstatic and charged with emotion, I walked the several miles home, my mind so filled with this glorious experience that I remembered nothing of the walk.

The next day I returned to the field and found the flaps of the office tent laced up and no one in charge. What matter, my love was there, her wing-tips tethered to the ground. Not a soul in sight; obviously there would be no flying today. I had her to myself and until nightfall I remained with her.

Many times I walked around her, feeling the taut wing fabric, stroking the polished interplane struts and cautiously pressing the airscrew to feel the inert power of the engine. I rubbed my fingers along the delicate fins of the cylinders and delighted in sniffing my dirtied hands. Burnt castor oil and petrol—could there be a more exquisite perfume? Beneath the engine the grass was stained with a patch of this mixture and beside it I sat down. I had in my pocket a treasured document, a piece of paper issued to me in that tent the day before. I got it out; it would prove that I was not dreaming. I looked at the printed headings and the pencilled additions:—

THE MIDLAND AVIATION COMPANY

Passenger Flight Certificate

This is to certify that M.....*N. H. Warren*
was a passenger in a flight made this day
on a biplane.....*April 19th, 1922*

F. Neale
Pilot Aviator

Life was very, very sweet.

The early twenties were the age of the barnstormer, the joy-ride pilot, and in the spring and summer these lone airmen travelled around the country, initiating many ordinary folk into the delights of flying. The barnstormer would announce his arrival at a town or village by sticking posters on walls and hoardings. These posters would read somewhat as follows:—

JOY RIDES

CAPTAIN SMITH

will be flying his Avro Biplane
from Potter's Field
From April 10th to April 30th

FLIGHTS FROM 7/6

Potter's Field, more likely than not, would be a small meadow, perhaps two hundred and fifty yards long and half as wide. This inadequate area would allow take-off and landing in one direction only, but, to add to the difficulty, it was probable that the hedge would be topped with a row of trees. The pilot would be quite unconcerned; he would have judged there to be just length enough within a yard or so, and there was space between the trees to give a few inches clearance for his wing-tips. These ex-RFC Avro pilots were superb flyers; restless and adventurous, unable to settle to a civilian job, they plied the only trade they knew. Their equipment

"We banked gently over map-like rows of roof-tops . . ."

A few Avros gave joy-riders the rare experience of marine aviation. This one, owned by a Capt Storey, was photographed at Paignton, Devon

The Barnstormers.

was an Avro 504K biplane, bought from a disposal firm for a few pounds, a couple of dozen cans of Shell petrol, a few spares for the rotary engine and a bell-tent to house the odds and ends and to serve as a ticket office.

Joy-ride Avros were modified to carry two passengers in an enlarged open cockpit behind the pilot. You mounted to this cockpit by clutching the leather padding on its rim and stepping up on two toe-steps let into the fuselage side. The aluminium bucket seats, with leather cushions, were mounted on narrow wooden bearers which also acted as foot-rests. From the interior the structure of the fuselage was quite open to view; lengthwise ran the upper and lower wooden longerons, connected every three feet or so by vertical struts. The rectangular frames thus formed were diagonally braced with wires. The fabric covering, usually doped a dark green colour, was stretched around the outside and attached by lacing to the struts and longerons.

Immediately in front of the pilot's and passengers' cockpit was fixed a ridiculously small adjustable windscreen which gave practically no protection from the slipstream. Looking forward from the passenger's seat one could see the pilot's instrument board, equipped with all the instruments which in those days were considered necessary for an aeroplane: airspeed indicator, watch, altimeter, two pulsometers indicating oil pressure, revolution counter, cross-level (also called a clinometer), air pressure gauge for main petrol tank, and compass. The flying controls were a column, shaped like a ball-headed walking stick, and a rudder bar consisting of a wooden bar pivoted centrally and fitted with aluminium foot-grips.

Engine controls were throttle and fine-adjustment thumb-levers mounted on a quadrant on the port side of the cockpit, hand-pump for pressurizing the main petrol tank (which in flight was served by a windmill-driven air pump mounted on a centre-section strut), three-way petrol cock connecting either the main tank or the gravity tank to the engine, twin-knob tumbler-type switch for operating the magneto cut-out, and a master switch. In addition there was a push-button switch fitted to the top of the control column—the "blip" switch, used for controlling the engine during the landing approach.

Suppose you are seated in the front cockpit and you are about to fly an Avro: you proceed like this. See that the switches are in the "Switch off" position, then pump up correct air pressure. Turn on the petrol taps and open the throttle, moving the fine-adjustment lever about one-third along the quadrant. After ten seconds or so, turn off petrol and the engine is ready to suck-in. The mechanic will call "Switch off"; you answer "Switch off"; and he proceeds to turn the engine over nine or ten times. He then calls "Contact"; you switch on and reply "Contact"; and he swings the airscrew. As soon as the engine fires you turn on the petrol. You regulate the engine with the fine adjustment until smooth running is obtained, at the same time watching the revolution counter and noting that the oil is moving in the pulsometer glass. You then waste no time in taxying for take-off, as a rotary engine must in no circumstances be run-up for more than a minute on the ground.

The Avro 504K was not easy to fly, and I am sure that the pilot who had learned on modern trainers would find it a handful. The narrow wheelbase, coupled with the torque effect of the rotary engine, caused a considerable swing on take-off and landing. In the air the controls were light, sensitive and quite powerful, resulting in exceptional manœvrability, but the modern pilot going into a turn on an Avro would be in for a surprise. On a steep right-hand turn the torque reaction of the rotary engine would take charge and he would be alarmed to feel the nose being forced downwards, requiring full top rudder to trim. On a steep left turn he would again have to press hard with the left foot, this time to stop the nose from rising.

These defects came to be viewed as merits and an Avro-trained pilot was rightly considered to be capable of flying any type of aeroplane. Avro 504s were adopted during the First War by a Service flying school at Gosport, and there, under the inspiration of Colonel Smith-Barry, a standard of flying ability was demanded which has never been surpassed. A Gosport-trained pilot was the finest in the world and from this famous school graduated many of the barnstormers.

There must be dozens who, like myself, caught the air-fever from a barnstormer and who later learned to fly and started a career in aeronautics. In the early twenties there were very few private flying schools in the country and for most of us the only opportunity to learn to fly, or to obtain a passenger flight, was provided by the barnstormer. Without doubt he performed a valuble service for aviation.

More "Local" Flying

A SECOND CIRCUIT OF AERONAUTICAL INN-SIGNS

By Leslie Hunt

MY piece in the August 10 issue about inns with aviation connections has brought a flow of letters—enough, in fact, to justify getting airborne for a further round of visits. The Editor commented that he envied me the research necessary for this second feature; but he might have changed his mind had he gone, as I did, in pursuit of *The Blenheim* at Epsom. Perhaps I should have realized beforehand that this particular sign simply commemorates the late Aga Khan's Derby winner of 1930!

Returning for a moment to *The Britannia*, in Mare Street, Hackney, London (briefly mentioned in the first article), the sign here is noteworthy in that, unlike the majority of inn-boards, it bears two entirely different pictures—in this case they are air-to-air views of a Britannia with a pleasant cloud background. It brightens considerably an otherwise colourless neighbourhood, and the brewers are to be congratulated on departing from the customary sign for such a name—the Britannia of our copper coin. In this connection I am told by a reader, Mr John C. Sawtell, that another *Britannia*, not far from the *Bristol Bulldog* at Filton, makes the best of both worlds by having the airliner on one side of its board and the lady on the other.

As in the case of *The Blenheim*, another trap for the unwary innvestigator (sorry!) is *The Comet* at Shrewsbury—actually named after a stagecoach which once served that city; and thanks to Derek James of Whitworth Gloster Aircraft, I now know that the *Glocester Flying Machine* near the factory is also named after a well-known

Mare Street, Hackney, in north-east London, is the location of this well-executed sign

coach which commuted between London and Gloucester (just *how* many ways are there of spelling that name?) at a very rapid rate in the 19th century.

But for my experience at Epsom I might have been tempted to visit *The Highflyer* at Ely—which I now know honours a great racehorse of 1851. I knew, too, that *The Bull* at Stony Stratford had nothing to do with disciplinarian flight sergeants; but there is an interesting story attaching to this house and the nearby *Cock*. When coaches to and from the capital stopped to change horses, passengers would go for meals to one or other of these inns, where the respective landlords would regale them with the latest news. At the next stopping-place it often happened that passengers from two coaches fed in the same hostelry and exchanged their gossip, only to find that those who had called at *The Cock* had one version while those who hadpatronized *The Bull* had a totally different one:

The sign for which planning permission is sought at Lee-on-Solent

Modernization of the 100-year-old Bricklayers' Arms near London Airport included re-naming with this attractive sign

The wrought-iron sign of the "Air Balloon" at Birdlip, near Cheltenham, Glos

and that (or so legend has it) was the origin of the phrase "cock-and-bull stories."

It seems that apart from *The Jet and Whittle* at Gloucester (of which more in a third and final article in this series), *The Leefe Robinson* is the only inn to honour an airman by name. What a pity, then, that this interesting pub as yet has no sign. The first public house to be built in its district since the war, this prefabricated building was opened in June 1954, at Brockhurst Corner, Harrow Weald, Middlesex—almost opposite the cemetery of All Saints' Church, where Capt Leefe Robinson, VC, is buried. In spite of the absence of an appropriate sign there is a definite aviation atmosphere in the two bars, aptly titled "The Cockpit" and "Kite's Bar." In both there are splendid murals of the S.L.11's destruction which followed Leefe Robinson's attack (in a B.E.2C of No 39 Sqn) in the early hours of September 3, 1916. Newspaper cuttings about the first enemy airship to be shot down on British soil are displayed on the walls.

During 1955 new gardens were laid out at the Plough Inn, Cuffley, Herts, and named after Leefe Robinson; for at this pub was held the inquest on the S.L.11's crew, and the landlord has an album of pictures and cuttings of the scenes outside his premises when the night intruder crashed in flames. Incidentally, the S.L.11 was not a Zeppelin, but a wooden-framed craft of the Schutte-Lanz type.

Leefe Robinson was promoted captain and flight-commander in No 48 Sqn, then flying the Bristol F.2a. On April 5, 1917, on his first operational flight on the Western Front, his aircraft was one of six Bristols which encountered the Richtofen *Staffel*. The five Albatros D.IIIs wreaked havoc, bringing down four of the six Bristols (another returned badly damaged). Taken prisoner, Leefe Robinson was in eight different camps, escaping several times and enduring solitary confinement as an habitual "offender." Eventually repatriated after the armistice, he fell to the influenza epidemic and died on December 17, 1918.

Replacing an earlier board of the *Air Balloon* at Birdlip, near Cheltenham, is the highly original wrought-iron sign illustrated on this page. One of the local inhabitants tells me that the name commemorates the first balloon "commander"—Capt Coutelle of the French Army, who, when the Dutch and Austrian armies were besieging Mauberge in 1793, went aloft *with* 50 *men*! Maybe another tale, that the pub is named after a Walter Powell who ascended from Malmesbury, never to be seen again, is more acceptable?*

Few inn-signs have achieved more publicity than that of *The Air Hostess* opposite London Airport. When Sir Miles Thomas, then BOAC chairman, unveiled this lovely board in May 1954, the event was reported in almost every newspaper in Britain, and in many overseas countries. Originally called the *Bricklayers' Arms* (it is thought the first owner was once a "brickie") the 100-year-old pub used to cater for market-gardeners and farmers in what was then the rural district of Harmondsworth. Harman's Brewery, of Uxbridge, changed the name as a tribute to the hard-working stewardesses of BOAC and as a token of thanks to the airport staffs using their establishment—an idea which comparably situated pubs could copy to advantage. Incidentally, feeling it would be invidious to select one of their own girls, BOAC called in a young film actress, Pauline Olsen, to sit for the signboard artist, in uniform, and the 210 charmers of the airline gracefully bowed to this neutral choice.

Reverting for a moment to my earlier remarks on "bull," it is worthy of remark (and *not* with any association of ideas!) that a recently retired RAF officer, Sqn Ldr Tony Smith, MBE, of 2nd TAF, of West Africa, and of Air Ministry, has become mine host at *The Flying Bull* inn at Rake, near Liss in Hampshire. Though we may regret that there is no sign showing a prize animal being loaded into an air freighter, it is of interest to learn that Tony Smith's new home is steeped in history—smuggling and murder (a suspect actually arrested in the bar) being only two of the items in the inventory. Incidentally, this pub happens to form the boundary between Hampshire and Sussex—the demarcation line is drawn down the public and saloon-bar walls and its owner pays rates to both counties.

Also in Hampshire and, most appropriately, at Lee-on-Solent, is an hotel formerly called *Marine Court* and now, thanks to the new "pubmaster" and his wife (*both* ex-Fleet Air Arm) re-named *Swordfish*. Planning permission is now awaited for the erection of an imposing sign showing a "Stringbag" releasing a torpedo. David Conway, the managing director, educated at Gordonstoun and in HMS *Conway*, served in the Merchant Navies of both Britain and New Zealand before holding a short-service commission in the Fleet Air Arm. He holds a second mate's certificate at sea and is a qualified air traffic controller on land, at Gosport, Lossiemouth, and Lee-on-Solent.

The hotel is situated a "jink to starboard" off the end of the main runway at Lee-on-Solent, and its Taranto Bar overlooks the approach to Runway 05. Here the *decor* includes a scale-model swordfish, a picture of one over *Ark Royal* (presented by Fairey Aviation), original cartoons by "Chris" Wren of FAA machines, and the original scraper-board Illingworth drawing commemorating the 21st anniversary of the Fleet Air Arm. In another bar are drawings in colour of all the front-line squadron badges of the 1958 FAA; and, better still, a representative sprinkling of serving aircrew of 781 Sqn, with other FAA personnel, call in most evenings. Since Mrs Lorna Conway was a Wren at Plymouth before serving as quarters officer at RNAS Bramcote and at Lee-on-Solent, it is on the cards that reunions are the rule rather than exception—on both sides of the bar.

Like the Leefe Robinson and other "aviation houses," this establishment has that indefinable air so often missing from the non-flying pubs. Long may their barrels roll out—empty—and refuelling facilities flourish.

"The Leefe Robinson" at Harrow Weald, Middlesex—one of the very few public houses commemorating the name of an airman

[* According to Charles Gibbs-Smith's *History of Flying*, Capt Coutelle was the pilot of the French company of *Aerostiers*, formed in 1793. They indeed used a (captive) balloon at the Mauberge action on June 2, 1794, but only Coutelle and an observer, N. J. Conté, ascended in it. This is the earliest authenticated use of a balloon in war—Ed.

SPORT AND BUSINESS

Private View

BY P.P.O.

"We must make a bridge between the two sides of aviation . . ."

THOSE of us who are now rather long in the tooth will remember a series of little plays which flourished in London during the 1930s, known as Grand Guignol. They were, I think, imported from France. They were all horror stories acted with ghastly skill and realism. One theme ran through them, irrespective of the actual plot or form of horror inflicted on the audience. It was always the inevitability of fate; nothing would save the wretched characters from the ghastly fate which awaited them. You could only sit in your seat and watch the slow and steady unfolding of the dreadful processes of accumulating doom. It was no use hoping that your hero would escape. You knew he wouldn't. The only hope was that one day the evil-doer would, in his turn, suffer the appalling torments that were so realistically portrayed.

The modern prosecutions of private pilots have something of this Grand Guignol quality. No one who flies a small aeroplane at all regularly, or attempts to use it for any sort of serious business, or pleasure, can avoid sooner or later breaking the law. And sooner or later, fate, in the shape of some informer, will step in and he will find himself embroiled with the Director of Public Prosecutions. Then, with ghastly inevitability, the processes of the law will begin—the visits of the police, the summonses, visits to solicitors, the scorn of the magistrates, the feeling of being a sort of social pariah, threats of heavy fines or imprisonment, the suggestion that one has hazarded the lives of hundreds of people.

Grand Guignol died a natural death in this country because, after a while, healthy-minded people got sickened with horror. There are signs that the blessed light of commonsense is penetrating certain gloomy recesses, even in the aviation world. Forward thinking and forward looking should be very much the concern of the Ministry of Aviation if they are to carry out the duty laid on them by Parliament to encourage civil flying in all its aspects. They must visualize an increase in scheduled airline traffic of perhaps ten or twentyfold. They must contemplate a great number of well-equipped business and private aircraft flying from town to town all over the country, and Europe, working to close time limits. They must accept that there will be an enormous number of owner-pilots of pleasure private aircraft wanting to use their machines to escape the overcrowded roads, and to visit their friends at home and abroad with reasonable punctuality and absence of fuss. And they must accept that sportsmen will want to use the air as they do the roads, with single-seaters like the Turbulent, and with gliders.

This might appear to be a terrifying prospect for the Civil Service mind, but quite an easy one for the commonsense mind. And the answer very simply lies in accurate altimeters, engine silencers, and a good view out of your aeroplane. All pilots are in the habit of adjusting their altimeters to zero before they leave the ground. This is rather a naughty habit if you don't trouble to get a QFE and a check on the aerodrome height beforehand. Obviously, the little aeroplanes should fly in the lowest height band, whatever it is. Therefore, they must be kept as quiet as possible so as not to annoy people on the ground. The argument that heavily loaded airliners just cannot climb to a respectable height for many miles after take-off is a shocking one. Such a machine is simply not airworthy. Equally, the argument that the large aeroplane flies in all conditions purely on instruments, and never keeps a proper look-out ahead, therefore everything else must be kept out of its way, has already led to a lot of accidents from the obstinate habit of hills and high ground of maintaining their positions, irrespective of the instrumental observation of the pilots.

Everybody knows, and statistics show, that while obviously the risk of mid-air collision exists, it is the least of the dangers attendant on flying. But nearly all the complicated legislation which makes up air law, not only in this country but also abroad, is designed to eliminate this millionth chance.

* * *

One of the best and most entertaining features of the flying world are the excellent newsletters which are sent to all their members by many of the more active clubs. I see a number of them, but would like to see more. So if any club secretary will put PPO on his mailing list, I shall be most grateful.

One good theme runs through all the letters I read, and that is that the number of applications for flying lessons is steadily improving. Also, that quite a number of club members went in for extensive foreign tours last summer. These accounts of foreign tours make fascinating reading, and must whet everyone's appetite to go and do likewise.

It would be nice to take a leaf out of the book of the Royal Cruising Club, who put up an annual cup as a prize for the best cruising log in a sailing yacht, the competition being judged not only on the actual merit of the cruise, but also on the literary quality of its description. The Royal Aero Club could well organize such a competition, or even the Ministry of Aviation.

* * *

We now know that, by this time next month, the Royal Aero Club will have left its familiar premises in Piccadilly for a new home in Berkeley Square—still, fortunately, within an easy stroll from Londonderry House, where so much of the Club's real work is carried on. We all hope that the move will be for the good of private and sporting flying, for which the Royal Aero Club was founded, and not merely for the comfort of its present-day members. It could well be so. The new premises will contain squash courts, a swimming bath, and even a fencing *salle*—all attractions for younger people.

We must make a bridge between the two sides of aviation today—on the one side the enthusiastic but generally hard-up man or woman, young in age or mind; and on the other side the more experienced, sometimes disillusioned and perhaps better-off older member who remembers the past very well, but has not so many ideas for the future.

The days when there were many young people with money to burn have gone, perhaps never to return, but growing up are a large number of fairly young business and professional folk, earning good money in their respective occupations, who so far have not really considered the use of the private aeroplane for business or sport. Joining the Aero Club has for them at the moment no great attraction. If, as a result of new premises, the Club can attract them into the fold, it will be a splendid thing.

It is also to be hoped that the younger enthusiast will now feel it worth his or her while to find the money to join. Unfortunately, among the many and growing numbers of flying-club members all over the country, you do not find many who are members of the Royal Aero Club. Naturally enough, they prefer to spend their money and time actually flying or gliding, and not just talking about it on committees. But committees and discussions are very necessary evils with the state of law and development as it is today, and will be for many years to come. So let us all hope that this move will initiate a real move forward in the Club's history.

* * *

Now is the time for all flying clubs to be making their plans for next year—the competitions they hope to run, the foreign tours to organize; and then there is their annual air show if they want to run one. The Tiger Club, with successful shows at Sywell, Shoreham Fair Oaks, and Southampton, have proved that with good but modest advertising, it is possible to bring 7,000-8,000 people to an aerodrome on a Saturday afternoon to watch quite a moderate display, and to keep the crowd under proper control—and to see that they all pay to get in!

Joy-riding, too, is by no means dead, and can be a real money-spinner for the local club when you have a good queue to work on. And who can say that among the crowd you will not be sowing the seed of encouragement to the potential private flier and private aircraft owner?

WHEN SECONDS MEAN SURVIVAL

.....it is then that a Martin-Baker ejection seat really proves its worth. In the dramatic photograph above, recently released by the United States Navy, the pilot of a Chance Vought F8U-1 Crusader can be seen escaping from his burning aircraft just before it plunged over the side of the aircraft carrier Franklin D. Roosevelt. The ejection seat used, a Martin-Baker Mk.F5, was one of several thousand supplied to the United States Navy as standard equipment for ten different types of their fighter and strike aircraft.

MARTIN-BAKER

British Executive Air Services have the first Cherokees for sale in this country

Offered now for immediate delivery by B.E.A.S. are the first of the Piper Cherokee 160's, a brand new Executive/Touring aircraft of low wing, single engine design.

A full four-seat, spacious cabin with exceptional visibility — Fixed tricycle undercarriage — A cruising speed of 132 m.p.h. T.A.S. at 75% power, an optimum cruising range of 900 miles using less than 6 galls. per hour together with low operating costs, are all features of this fine all-metal aircraft.

The price of the Cherokee 160, which can be flown away from Oxford with full tanks, is £5,860.0.0

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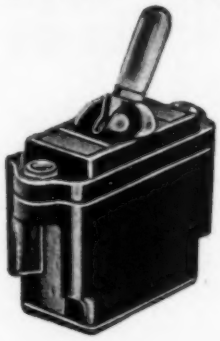

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Prototype of the new Beechcraft Model 23 Musketeer, which made its first flight on October 23 and is now at an advanced phase of its factory flight-test programme (see news item below)

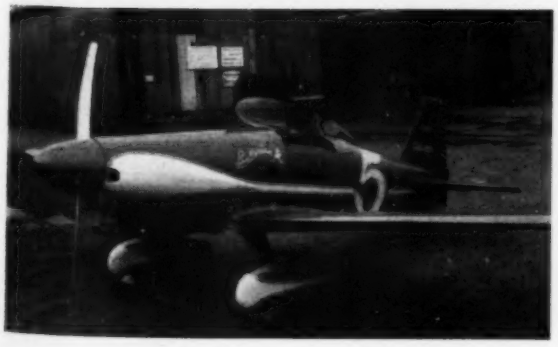
SPORT AND BUSINESS...

FIRST ENTRY by Beech Aircraft Corporation into the relatively low-priced field in four-seat, single-engined light aircraft is represented by the new Beechcraft Model 23 Musketeer, the prototype of which is illustrated above. Production deliveries should begin next autumn at a selling price of approximately $12,000.

Powered by a 160 h.p. four-cylinder engine, the Musketeer has an empty weight of 1,235lb, gross weight of 2,300lb, and useful load with 40gal of fuel of 1,035lb. Total fuel capacity is 60gal. Estimated gross-weight performance includes sea-level maximum speed, 146 m.p.h.; cruising speed at 75 per cent power and 7,000ft, 138 m.p.h.; cruising speed at 65 per cent power and 10,000ft, 128 m.p.h.; and maximum range 980 miles. Stalling-speed with 30° flap is 60 m.p.h. and take-off distance to 50ft is 1,420ft.

"Operating economy, comfort and utility superior to any other plane in its weight and power class" are claimed by the company for the Musketeer. The standard aircraft will feature "essential instrumentation and a new Beechcraft navigation and communications system." The company aims to capture at least one-third of the market for $10,000-$12,000 aircraft with the new machine.

Armstrong Whitworth Flying Group this year won the Popular Flying Association's Masefield Trophy for the third consecutive time. Seen here in the group's Tiger Moth "Weary Willie" are Tim McCormick and Colin Grimes, with (from the left) chairman John Nicholls, treasurer Raymond Hoile, vice-chairman W. Johnson and hon sec D. O'Clorey



VIGORS AVIATION LTD of Oxford Airport, Kidlington, were included last month in Piper Aircraft Corporation's "Million Dollar Club" (for agents whose retail sales exceed $1m during 1961) at the US company's international sales meeting in West Palm Beach, Florida, last month. The two other overseas Piper agents which also exceeded this figure were Jonas Aircraft Co, a New York export firm, and Trans Aircraft Co of Hamilton, Ontario.

A RECORD OF THE HISTORY of the British Women Pilot's Association is to be kept by Miss Mary Martin and Mrs Ruth Stridiron, newly appointed joint historians of the Association. Relevant photographs, news cuttings and other material which might be of historical value should be sent, on loan, to Miss Martin at 1 Bathurst Walk, Iver, Bucks. Recently appointed editor of the Association's magazine is Miss G. H. Mackay.

FOLLOWING A RECENT MEETING in Inverness, the Highland Flying Club was formed with membership open to all the northern Scottish counties. The club will begin operations at Dalcross by chartering a Tri-Pacer from Black Isle Air Services. A membership drive is being inaugurated by the club committee, which includes Mr Hector Gordon Russell as chairman and Mr Grant of Ferndown, 13a Culduthel Road, Inverness as secretary.

A NEW ENGINEERING CENTRE has been opened by Piper Aircraft Corporation adjacent to the company's main plant at Lock Haven, Pennsylvania. Under the direction of chief engineer Walter G. Jamouneau, the work at the new facility will be concentrated on twin-engine and higher-performance single-engine aircraft, with experimental development of other Piper types continuing at the company's Vero Beach Development Center in Florida.

AN 11,000-MILE RETURN FLIGHT in a Rollason Turbulent from Redhill to Cairo is to be made by Mr Brian McAllister at the end of this month. He will be celebrating his 25th birthday during the flight, which is expected to take between three weeks and a month. The Turbulent has been fitted with a 10gal main fuel tank and a 5gal reserve tank, in place of the normal 8½gal tank, giving the machine a calculated range of about 500 miles. Mr McAllister plans to take off from Redhill on December 29. The complete trip, he estimates, will cost just over £50 in petrol. He learned to fly with the Coventry Aero Club and, after advanced flying courses, became a freelance test pilot. He has flown for Rollason Aircraft and Engines Ltd and for Field Aviation. Mr McAllister already has some experience of long distance flying, having piloted an Auster 15,000 miles across Africa on a photographic survey.

A SUBSIDIARY engineering facility is being established by Aero Commander Inc at Santa Monica, California. The company's main engineering operation will remain at Norman, Oklahoma, with certain components of the forthcoming Model 1121 Jet Commander being engineered at Santa Monica.

CENTRAL CHKALOV AEROCLUB of the USSR has presented the FAI with a silver cup bearing the name of the Russian aviator Nesterov. The trophy will be handed to the FAI President for presentation to the winner of the next world aerobatics championships.

A DEMONSTRATION Umbraugh 18 gyroplane will soon be available in this country, according to the UK dealers for the type, Holman and Co (Engineers) Ltd of Glasgow. The type was certificated by the US Federal Aviation Agency in September this year.

"Ballerina," a Cosmic Wind racing aircraft built by Tony Le Vier and Associates Inc, has been bought by Mr Norman Jones on behalf of the Tiger Club. It will be entered for next year's national air races

FLIGHT SYSTEM SURVEY

ATCO's special teleprinter equipment being operated by H. Cherry (MoA officer in charge of Apollo project). Watching are (left to right) D. S. Bray (Ferranti), R. E. Cox (head of Tels 15, MoA) and D. D. Lipman (head of MoA ATC Experimental Unit)

ATCO, COMPUTER, OR BOTH?

THREE years is given as the time for the first programme of evaluation of computers as aids to ATC. Ferranti's "Apollo" transistor computer—a general-purpose machine sired by "Pegasus"—has been installed at the Ministry of Aviation's Oceanic Control Centre at Redbrae (on the edge of Prestwick airport) as part of the evaluation programme.

The MoA offer three reasons for installation at Redbrae, rather than at an airways centre. Firstly, all essential information for oceanic control (OAC) is on teleprinter networks and is thus in a coded form suitable for a computer. Secondly, the problems of OAC may appear less pressing than those of the more congested airways, but traffic on the Atlantic route has risen from a peak-month figure of about 1,600 flights in 1951 to 6,200 this year—it is not expected actually to exceed the capabilities of manual control until about 1971—and the wide separations in height, distance and cross-track distance have a special character which makes the study worthwhile. For instance NATO on occasion takes over airspace above a certain height, normal communications are bad and the airline operators prefer to fly the same tracks in the west-east direction as are flown from east to west. Thirdly, the experiments could result in the provision of operational equipment for oceanic ATC sooner than would be possible with airways control.

The system at present in use for OAC depends solely on procedural control with the aircraft giving R/T reports at 10° longitude intervals; these come to the controller as teleprinter messages. Also the controller has the filed flight plan and has to liaise with Shannon, Iceland and Gander. From this information he makes up the usual flight-progress strips, approves flight and departure plans or offers alternatives, and ensures that the agreed separations are not infringed. If communication with an aircraft is lost he has to decide, from experience and the picture of the whole situation, whether this is a radio fade-out or a more serious matter. Much of his time is thus spent in collecting information, sorting it and making up flight progress strips. Apollo can do all this clerical work for him.

The computer is at the moment running at less than a tenth of its capacity on ATC and it could spend the rest of its time on some totally unrelated task. In fact this "spare" time will be used for analyses of air traffic for future planning; but the idea of one civil air computer handling seat bookings, payroll, maintenance-store records and myriad other clerical tasks that airlines have to carry out is an attractive one. Running for 24 hours each day, Apollo will also give valuable information on its own reliability.

Once sufficient experience has been gained the computer may run in parallel with the existing control system; but at present Apollo is re-living the past. It is fed with recorded messages from a day's traffic, plus some extra simulated traffic, and is occupying four controllers on a three-month "stint."

Currently, incoming information is written by hand onto a sheet for each aircraft, this sheet giving aircraft identification, expected latitude and time at each reporting longitude, flight level, departure time and whether east- or west-bound. This is seen by the assistant controller to check that the information is plausible and then is fed into the computer via an ordinary teleprinter keyboard. As soon as enough has been learned to programme, or tell, the computer how to do this itself, human intervention will be unnecessary.

Apollo then compares this information with other plans that have been filed, checks for possible conflicts and prints the result on the appropriate controller's teleprinter. Assuming that there is a conflict, the controller types out a modified plan: Apollo then runs through the procedure again and if it is satisfactory sends back the modified version. Then the controller can make up his flight-progress strip. Soon, when the appropiate machinery is installed, the strips will be printed out automatically.

Position reports are fed into the machine as they are received, compared with the original flight plan and again routed to the appropriate controller, warning him of deviations from the filed plan ($\frac{1}{2}$° latitude and ten miles distance are the present limits) and of any conflict that may result. Again the resolution is put to the machine for checking. Apollo will be able eventually to solve conflicts, feeding out the results in order of preference for approval.

An important feature is provision for situation displays on five-inch storage tubes; this equipment is ready and the displays are awaited from RRE.

Time information is also fed into the computer so that, whenever he desires, the controller may demand a list of aircraft whose reports are overdue by more than a specified number of minutes.

Already the computer has been instructed to deal with small human errors. If someone tries to feed in a five-figure time, for example, the machine will refuse to accept the information until it is corrected. If some correct data is fed in twice, "data already present" is typed out; and insertion of a position report for an aircraft whose flight has not been filed and approved results in "no data."

For checking of reporting times the machine is fed with 1sec pulses; on receipt of each pulse the computer finishes the work it is doing at that moment and does a trial calculation, whose successful outcome stops the ringing of an alarm bell. Thus any malfunction, even the failure to self-check, is detected less than a second after its occurrence. During the last 11 weeks that Apollo has been operating only three hours have been lost through faults.

The best ATCO or computer in the world cannot work without information and where this information depends on Atlantic HF R/T it is bound to be unreliable. BOAC have fitted all their Boeing 707s with equipment for reception of the LF teleprinter met report service transmitted from Stranraer, and the VC10s will have it too. This gives good cover, which could be made 100 per cent with another station at Gander, and obviously forms a good means of ground-to-air communication. Work in progress to improve air-to-ground communication includes the provision of high-power VHF stations feeding aerials of high directivity and gain, which can also aid reception. The first experimental station is at Mangersta on Lewis, and has achieved 400-mile ranges with jets.

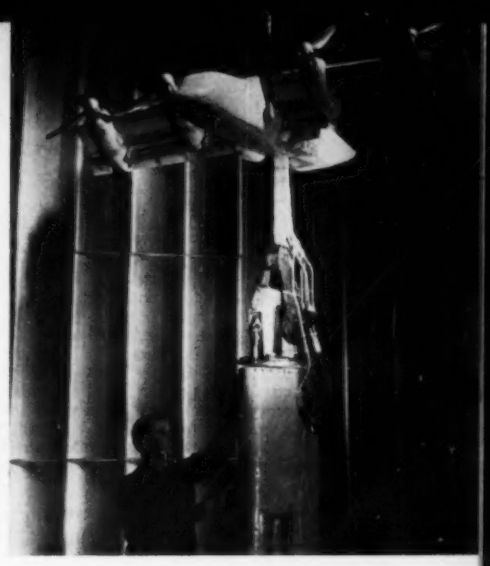
CANTAT, SCOTICE and ICECAN, the new undersea cables, will help considerably by linking Redbrae, Reykjavik and Gander control centres and a breakdown in any one cable will be restored via the other two in not more than five minutes. CANTAT and SCOTICE should be in service very soon and the completion of ICECAN by the end of 1962 will enable the Greenland radio station to improve radio communications still further. Also telegraph circuits devoted to ATC could give simultaneous printout—from the computer if need be—of flight information on both sides of the Atlantic and could provide for a teleprinter transmitter at Gander.

R. H. O.

Computer room at Redbrae. Right-hand cabinet contains equipment for storage tube displays, the other three the Apollo computer

VTOL Assault Transport

PRELIMINARY DETAILS OF THE US TRI-SERVICE DESIGN



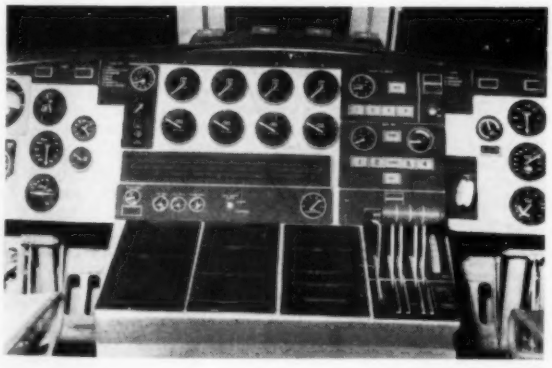
Basic aerodynamic behaviour of the design was evaluated with this large-scale tunnel model, with moving wing, flaps and propellers. It is seen mounted for testing in a low-speed wind tunnel

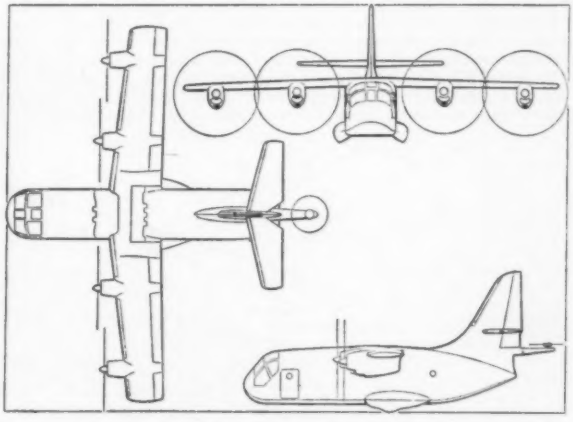
DURING 1961 the principal US military-aircraft competition was for a VTOL (vertical take-off and landing) transport suitable for all three American Services. It was won by a team consisting of Ling-Temco-Vought, Ryan Aeronautical Company and Hiller Aircraft Corporation. Outside Russia, at least, the competition was the first ever to be held for a VTOL transport, and the aircraft is envisaged as "part of a system designed for rapid transport of combat troops, equipment and supplies from assault ships or airfields into unprepared areas under all weather conditions."[1] The specification stipulated a cruising speed of at least 250kt, an effective radius greater than 200 n.m. operating at low altitudes, and the ability to carry an 8,000lb load in an unrestricted cargo compartment 30ft long, 84in high and 90in wide, with a level floor 36in from the ground. An obvious additional requirement was the ability to load vehicles, through a clamshell rear door.

Such were the terms of the specification that the optimum configuration was that of a propeller-driven aircraft with powerful flaps and a tilting wing. The winning design has a 67ft 6in wing attached to the fuselage at four points in the manner of the two-position wing of the Crusader fighter. An irreversible drive can tilt the wing through up to 100°, to allow the aircraft to hover in a tail-wind. Beneath the wing box are hung four General Electric T64-6 turboprops, driving 15ft propellers. A system of freewheels and spanwise shafting enables the aircraft to fly on any two engines. The tail unit, with slab tailplane, is supplemented by an 8ft-diameter horizontal tail rotor with variable-pitch blades to provide longitudinal control at low forward speeds. The wing has double-slotted flaps (the aft outboard sections operating as ailerons), together with Kruger leading-edge flaps outboard of each engine to prevent local stall of the slipstream during transition.

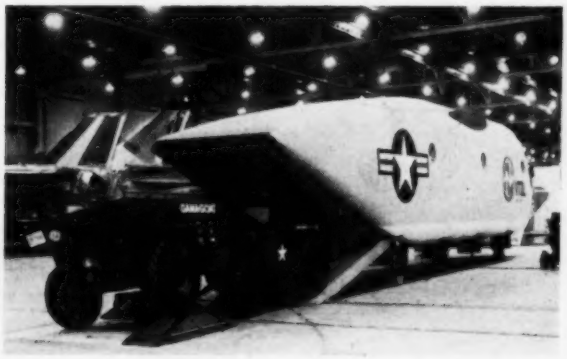
Unfortunately, it has proved impossible fully to meet all the requirements of the three Services. In the event, it has been decided that the programme will be managed by the Air Force, that the prototypes currently authorized will be designed for the Air Force and Army, and that the need for compatibility with aircraft carriers will for the moment be deferred. Total funding for the programme is expected to reach $70m (£25m), and this may prove a considerable underestimate if the supplementary research programme for more advanced concepts produces a configuration suitable for production. At present, each of the three Services has contributed $7m for the Fiscal Years 1961 and 1962 (i.e., up to

"Flight" copyright drawing





The mock-up of the flight deck shows a number of advanced features, including a 360° ball horizon, integrated flight instruments and push-button system controls. At lower right is a picture of the actual mock-up in the plant at Dallas, Texas, with an F8U Crusader interceptor in the background



VTOL Assault Transport . . .

next June 30), which will pay for five development aircraft. Chance Vought, Ling-Temco-Vought's aero-space subsidiary, is prime contractor; Hiller is handling the design and fabrication of the power-transmission system, including all gearing, shafting and propellers, and will make the flaps and ailerons; Ryan is responsible for the tail unit and rotor, engine mountings and nacelles.

Not yet named, the aircraft is designed to become operational in 1965, suggesting a first flight within 18 months. Robert McCulloch, chairman of the board of Ling-Temco-Vought, recently said, "Local-service airlines, among others, will find the vehicle exactly suited to inter-urban passenger carrying. . . ." Not everybody shares this enthusiasm, for most commercial operators will continue to operate more economical aircraft from existing airfields. But this VTOL transport does indeed mark a milestone in aeronautical development, and although less efficient than the helicopter in hovering flight is very much more efficient than the helicopter in cruising flight, besides being considerably faster. It is particularly appropriate that this development should be publicized at this time, for the NATO NBMR-4 competition calls for a V/STOL aircraft of generally similar type. In the European case, however, jet-propelled designs are being submitted, for the very long ferry requirement is absent, and flight speed and manœuvrability are more important than hovering endurance. Nevertheless, the "Tri-Service" aircraft has been used by Chance Vought as the basis for an entry in the NBMR-4 competition, in partnership with Fiat and Sud-Aviation.

W. T. G.

VOUGHT/RYAN/HILLER VTOL

Four 2,850 s.h.p. General Electric T64-6 engines

Span, 67ft 6in; length, 58ft; height, 26ft; cruising speed 250-300kt; max speed, 400kt at sea level; combat radius, 200-300 n.m. carrying max military load of 32 fully equipped troops or their equivalent; ferry range, 2,600 n.m. with auxiliary tanks

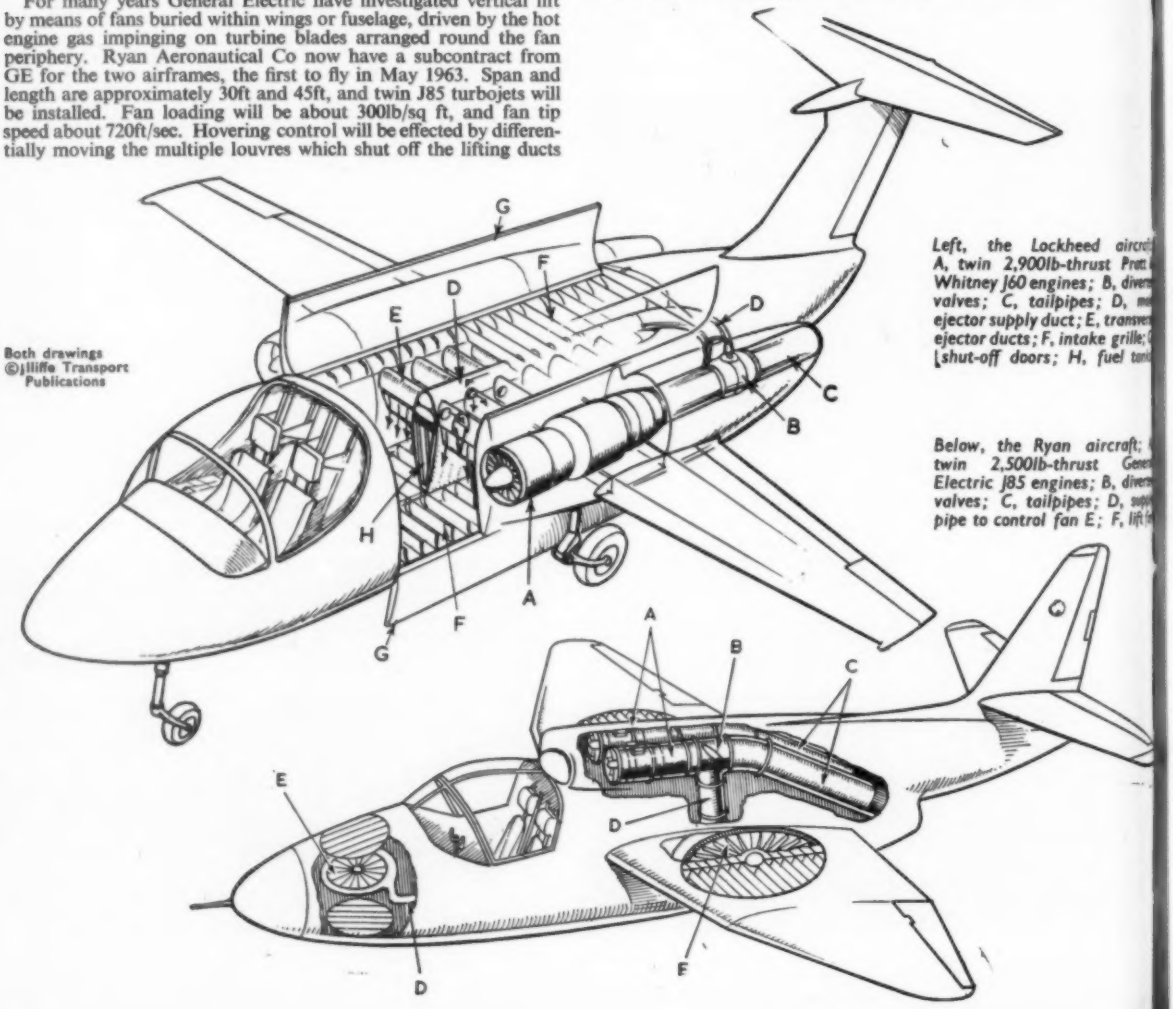
TWO ALTERNATIVE VTOL SYSTEMS

IN the previous article the point is made that a VTOL with a maximum speed not greater than 400kt can use the same set of propellers for both lift and propulsion. Faster aircraft cannot have propellers; but the turbojet has a relatively high efflux velocity, and is consequently an inefficient lifting medium (although in some high-performance aircraft the optimum solution may turn out to be turbojet lift, particularly when all but about 2min of each mission should be wing-supported flight).

Where hovering flight occupies a large percentage of each flight it is essential to reduce fuel consumption by employing a lifting system with a greater airflow and lower mean velocity. Two examples of both the research aircraft illustrated below are being built for the US Army Transportation Research Command to prove two promising methods of reconciling jet propulsion with relatively efficient hovering. In both cases, valves are used to divert the entire engine efflux to serve a lifting function for VTOL.

For many years General Electric have investigated vertical lift by means of fans buried within wings or fuselage, driven by the hot engine gas impinging on turbine blades arranged round the fan periphery. Ryan Aeronautical Co now have a subcontract from GE for the two airframes, the first to fly in May 1963. Span and length are approximately 30ft and 45ft, and twin J85 turbojets will be installed. Fan loading will be about 300lb/sq ft, and fan tip speed about 720ft/sec. Hovering control will be effected by differentially moving the multiple louvres which shut off the lifting ducts in forward flight, and a separate fan in the nose provides pitching control. Maximum speed will be 450kt, and the aircraft will have side-by-side ejection seats.

Closer to its first flight is the Model 330 Hummingbird, produced by Lockheed-Marietta (formerly the Georgia Division of Lockheed Aircraft). First illustrated in *Flight* for July 27, the Hummingbird's engines can discharge through transverse ejector ducts, which blast downwards within the centre fuselage to entrain a huge airflow to lift the aircraft. To assist transition, the ejectors are inclined 12° aft of vertical, so that the aircraft initially leaves the ground in a tail-down attitude. At about 80kt one engine is switched to provide forward thrust, and when the wing is supporting the aircraft the jet lift is shut off and the large doors closed. Again, the aircraft will have side-by-side ejection seats and a top speed of at least 450kt. Span and length are 25ft 8in and 32ft 8in, and the gross weight 7,200lb. First flight should take place next June.



Both drawings ©Illiffe Transport Publications

Left, the Lockheed aircraft: A, twin 2,900lb-thrust Pratt & Whitney J60 engines; B, diverter valves; C, tailpipes; D, main ejector supply duct; E, transverse ejector ducts; F, intake grille; G, shut-off doors; H, fuel tank

Below, the Ryan aircraft; A, twin 2,500lb-thrust General Electric J85 engines; B, diverter valves; C, tailpipes; D, supply pipe to control fan E; F, lift fan

It is possible that, by the time these words are read, the first de Havilland D.H.121 Trident (three Rolls-Royce Speys) will have made its maiden flight at Hatfield. Here the aircraft, G-ARPA, is seen having its final pre-flight engine-runs earlier this month

AIR COMMERCE

SECOND THOUGHTS ON GATWICK

BEA will no longer use Gatwick for London-Paris services, nor will Air France. It will be recalled that the corporation reluctantly acceded last spring to ministerial pressure to make more use of Gatwick, agreeing to do so when its partner Air France—with even greater reluctance—agreed to schedule some Paris services into Gatwick instead of Heathrow.

BEA says that traffic has not come up to expectations. The corporation originally planned to operate four daily Viscount return flights Gatwick-Paris, but in the event it only operated one. Air France, too, operated just one daily round trip. But load-factors have been low, and it is believed that, out of 11,000 BEA seats offered to Paris between April and October, less than 3,000 were filled.

A PIECE OF AN AMERICAN'S MIND

IN the opinion of Mr Daniel Walcott, the American whose US independent airline Trans Atlantic Airlines Inc is pulling out of Gatwick, the Ministry of Aviation is "acting with shocking disregard for the well-being of the British independent air transport industry." He says that Ministry's object seems to be "to drive all small UK independents to the wall. They don't protest because they daren't open their mouths."

Mr Walcott has been operating a C-46 and two DC-4s from Gatwick since March, with British pilots and staff, but he is now in the process of moving to Luxembourg. The Ministry has not, he says, made his company feel welcome. Not only has it failed to provide accommodation, but it has made him particularly aggrieved by its decision (reported last week) to ground one of his DC-4s, for alleged non-payment of landing and parking fees. The facts are, he says, that he has received two bills. The first, for £408, was paid last July—two days after its receipt. The second, for £1,007, came towards the end of November. This was not paid immediately, due to Mr Walcott's absence abroad, and on December 11 the Ministry put a lien on the DC-4.

It is understood that the Ministry apologized to Mr Walcott privately, for having overlooked payment of the original bill, but that it has been unwilling to do so in public. Mr Walcott's parting words: "We don't owe a cent to anyone. And I think you're going to have foreign carriers taking a lot of your business next summer."

CONTINENTAL-NATIONAL MERGER

CONTINENTAL and National, in a surprise announcement in Washington on December 13, revealed that their boards of directors had agreed in principle to a merger. The merged corporation would be known as National-Continental Airlines and would become the fifth largest US domestic carrier.

This latest alliance takes place against a background of an estimated net loss for 1961, after taxes and interest payments, of $30m for the 11 US domestic trunks—by far the largest loss in the US industry's history, and the first time since 1948 that it has failed to make a profit. Both Continental and National have kept their merger plans a close secret, and both carriers seem to have been weathering the economic crisis successfully.

The recent award to National of a Florida - California route in the Southern Transcontinental Service Case and the resulting order for seven DC-8 Series 50s to supplement its three DC-8 Series 20s was probably a powerful consideration in seeking new financial strength. National's route network extends from Boston, New York and Washington down the eastern US seaboard to Florida, from Florida west to New Orleans and Houston and to California. Continental's network extends from Chicago and the mid-west to San Francisco, Los Angeles and south to Texas.

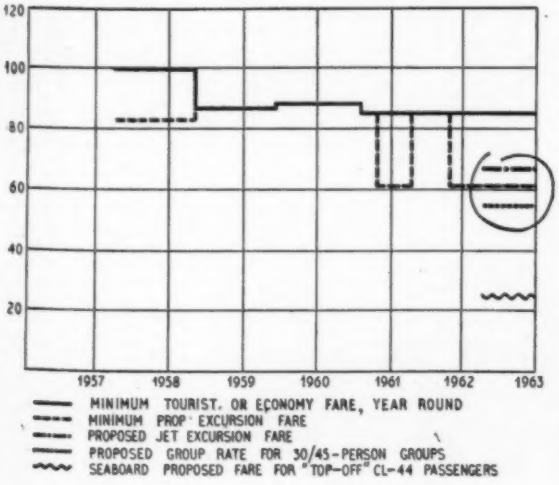
IATA CUTS TO COMPETE

EIGHT IATA carriers who have been privately discussing fares in Bermuda are said to have agreed on cheaper rates for the North Atlantic to come into effect on April 1, 1962. The fares reported to have been agreed, subject to government approval, are set out in the table. Chief benefit of the new proposals lies not so much in any drastic reductions but in the fact that current off-season excursion fares would be available the whole year round instead of from October 1 to March 31 as at present, and the new fares would be valid for 23 days instead of 17.

The development of group charter business into what is virtually a fourth, sub-economy class has caused IATA to think hard about introducing rates for groups on scheduled services, and a rate of £107 for groups of 30-45 is said to have been suggested. This is still a long way from typical group rates, and from Sea-board World's proposed £47 return fare for "top-off" passengers on its transatlantic services as is evident from the illustration.

London - New York Return Fares

	Existing		Proposed	
Standard economy class:				
Propeller	£154 5s		—	
Jet	£173 13s		—	
Excursion economy class:				
Jet	£125	17-day, available October 1—March 31	£125	23-day, available all the year round
Propeller	£114 6s		£114 6s	
Proposed new group rate	—		£107	



This graph is a modification of one that was produced by British United as ATLB evidence. It shows the new North Atlantic fare levels believed to have been agreed during the recent IATA talks in Bermuda. A note and a table in column 2 provides further information

A regular sight at London Heathrow Central these days are the two blue and white Viscount 708s operating the scheduled Starways service between the capital and Liverpool. They previously belonged to Air France

AIR COMMERCE...

STATUS QUO IN SYRIA

A PHOTOGRAPH in these pages on November 23 of a DC-6 in the markings of Syrian Arab Airways calls for a brief record of the renaissance of Syrian air transport. Following the recent abrogation by Syria of its membership of the United Arab Republic, the Syrian component of United Arab Airlines also asserted its independence.

The new Syrian Arab Airways, as it is called, operates a fleet of three DC-6Bs, two DC-4s and three DC-3s. Operations include domestic DC-3 services and daily DC-6B flights on the Damascus-Kuwait-Bahrein-Doha route. A service linking Damascus with Baghdad and Tehran, and with Athens and Rome, is also to be inaugurated.

As far as can be ascertained the new airline was formed on October 14. Chairman and general manager is Gen Tewfic Krawi; other board members include Youmni Demloge, Gen Naim Wafai, Abdul Jawad Sarmini and Zuheir Aita.

AIRPORTS AUTHORITY BILL DELAY?

A SAD illustration of the place aviation occupies in the long queue of subjects to be considered in the course of Parliamentary business was provided in the House recently when Mr Chetwynd (Lab, Stockton-on-Tees) asked the Minister of Aviation when he proposed to bring in legislation to establish an airport authority. Mr Thorneycroft's reply was that it was unlikely that there would be the necessary Parliamentary time for a Bill to establish an airport authority before the next session.

Sir Arthur Vere Harvey (Cons, Macclesfield): "Will the Minister consult with the Leader of the House and see if time can be found? It is generally agreed by both sides of the House that the sooner London Airport is handed over to an independent authority the more efficient it will be. If it has to be tolerated for another two years it is really the end."

Mr Thorneycroft: "I have no doubt this will reach the ears of the Leader of the House, but I can give no undertaking."

Mr George Brown (Lab, Belper): "If the Immigration Bill was dropped there would be time for this."

AIRLINER MARKET-PLACE

ACQUISITION of a Lockheed 60 Santa Maria by Basutair, the Basutoland outback airline whose activities were the subject of an article in *Flight*'s October 12 issue, is among the most interesting transport aircraft sales disclosed by the current range of Air-Britain publications.

At the other end of the scale, TAP has acquired two L.1049G Super Constellations from Guest Aerovias Mexico; these aircraft were ordered by and delivered to Thai Airways over three years ago, but after remaining inactive at Bangkok for some months they were sold to Guest through SAS when the latter formed Thai Airways International Ltd. They did not see many months' service with Guest before the Mexican carrier replaced them with Comet 4Cs leased from Mexicana for its transatlantic services.

TWA has sold four L.1049G Super Constellations to Trans-International Airlines, Inc, and leased an L.749A to Pacific Northern, while Tunis Air has sold an L.749A to the French SGACC organization who will use it for air-sea rescue duties.

The Cunard Eagle Britannia 318 leased from Cubana has now been returned to the Cuban carrier, while Alitalia has leased a DC-7C to its charter affiliate Societa Aerea Mediterranea. KLM is reported to have sold four DC-6Bs to a Jugoslavian firm called Adria Aviopromet, although Jugoslovenski Aerotransport has disposed of one of its DC-6Bs to the Jugoslav Air Force. Trans Arabia Airways has acquired another ex-American Airlines DC-6B. Loftleidir has brought a fourth aircraft of this type, and the Transair Sweden DC-6B in which Mr Dag Hammarskjold lost his life is now known to have been acquired from Aramco—the Arabian American Oil Co—which used it to fly personnel between New York and Dhahran, Saudi Arabia.

The Danish charter operator Nordair has acquired two more DC-6s from American Airlines to add to the three of this type in use. Braathens has sold a DC-4 to the French Navy and the Luxembourg charter operator Interocean Airways SA now has a fleet of five DC-4s.

Maritime Central Airways has sold its remaining Viscount 805 to Aer Lingus, and Northeast has leased a Viscount 745 from Vickers. The Royal Pakistan Air Force has disposed of two Bristol Freighter 31s to Ansett-ANA, plus one for spares, and one to TAA, plus two more placed in storage by TAA. Eastern has now disposed of three of its Martin 4-0-4s to ASA International Airlines, and four to Mohawk. TWA has sold two Martin 4-0-4s to East Coast Flying Service, and may sell another 15 to Piedmont.

£3m FOR THE SUPER CARAVELLE?

TOOLING and design costs of the Sud-Aviation Super Caravelle, according to *Les Ailes*, will be paid for by the French Government, and the price of each aircraft will therefore be about NF35m, or some £2.5m—a figure which, if it can be achieved, will certainly be highly competitive and will bring the Super Caravelle within the reach of most operators likely to need a supersonic airliner. The break-even point will be reached at 80 aircraft, but Sud foresees a market for 250 because the Super Caravelle will be several years ahead of any American Mach 3 transports.

Sud envisages a first flight in 1965, first demonstration flights in 1967 and service in 1968 if all goes well. Price, timing and design are obviously still dependent on a great many very important "ifs," not least of which is British participation in the programme.

The Super Caravelle wing is of gothic delta plan form with considerable leading edge camber designed to provide adequate longitudinal stability. Three control surfaces on each wing might possibly indicate the use of split elevons and a longitudinal trimming surface, as on the Mirage 3. The structure is mostly light alloy, but the control surfaces are of steel, and the unstressed portions of the underslung engine nacelles titanium. Powerplants are four Olympus 593s of 28,600lb thrust each paired in the nacelles, with adjustable ramp intakes and con-di jet pipes.

The fuselage has a very slight "double-bubble" cross section, and is of normal construction with closely-spaced windows. It seems to be narrower than current subsonic jet practice, since four-abreast seating for tourists and three abreast for first-class passengers is envisaged; the payload of 22,000lb will allow for 100 passengers. The Hispano steel main undercarriage, shown in model form at the Paris Salon, comprises four-wheel bogies retracting into the fuselage and a twin-wheel nose leg.

The Super Caravelle's structure is fail-safe, and it will cruise at M2.2 at 49,000ft, the airframe reaching a stabilized temperature of 120°C. Mach 1 will not be exceeded below 39,000ft. A thrust-weight ratio of 0.5 will allow the aircraft to use normal runways for take-off and landing. Maximum range will be 2,800 miles and normal stage lengths will be between 1,250 miles and 2,800 miles. Paris to New York time, with a single stop at Gander, will be 3hr 30min.

The 200ft "finger" departure building at Dublin, just completed, will be brought into use to handle the Christmas peak traffic between Ireland and the UK

A large number of light aircraft are being imported into the UK by air these days, mostly by BOAC and PanAm DC-7Fs and Seaboard Super Constellations. Vigors Aviation have been a large user of these services; all their Piper Colts have been air-freighted so far, and now the new Piper Cherokees, one of which is shown here outside the BOAC freight shed at London Airport North in its 1962 colour scheme

2,000,000 JET HOURS

IN *Flight* for February 10, 1961, we published an article entitled "Now a Million Jet Hours," in which a method of assessing aircraft accident rates was suggested, based on total losses per 100,000 flying hours. It was shown that, on this basis, jet airliners were destroyed during their first million hours at roughly twice the rate at which propeller-driven airliners were being destroyed. The prediction was made that "the two million jet-hour mark may well be reached before the end of 1961, possibly two or three months before the end."

During the last few days of October, just over three years since the Comet 4 and Boeing 707 were first put into service, total jet airliner flight time on all types passed the two million hours mark. How has the second million turned out from an accident point of view, and how does the overall jet record now compare with the propeller driven types?

It will be recalled that, during the first million hours, nine jets were totally destroyed. Five of these losses occurred on training flights, and, because of this, it was suggested that the record might reasonably be expected to improve. There has in fact been a slight overall improvement, using the total loss rate as a measure, although in some respects the position could be said to have deteriorated. The number of total losses during training fell to zero in the second million. (The Lufthansa 720B training accident, though shown in the table, occurred after the 2,000,000hr mark.) However, on passenger services, seven aircraft were totally destroyed, compared with four in the first million. Losses thus fell from nine to seven.

By mid-December, jet flight time stood at approximately 2.25 million hours, and aircraft destroyed totalled 18. So, on average, there has been a total loss every 125,000 hours. As was mentioned in the previous article, a comparable figure for medium/long haul piston-engined transports, for the three-year period 1956-58, was one total loss per 300,000 hours. A comparable figure for all types of non-jet airliners was one total loss every 200,000 flying hours.

A study has since been made of the 10yr accident record of DC-6/7 and Super Constellations—which, by and large, the jets have replaced—and the total loss rate was again found to be approximately one in 300,000 flying hours. This shows that the three-year period 1956-58, used previously as a basis of comparison, was not by chance an above-average period, and it suggests that this is the sort of rate which could fairly be regarded as a target for the jets. In this light the jet record to date of one total loss per 130,000 hours cannot yet be regarded as satisfactory. But it might be argued that it is hardly fair to include the first year or two of jet operations in a current analysis, as a settling-in-period is only to be expected. In that case, let us consider the last 12 months of operations (mid-December 1960 mid-November 1961). In this period 1.4 million jet hours were flown, and 11 aircraft were destroyed, making the total loss rate one per 127,000 hours, which is not substantially different from the average based on total jet flight time since operations began.

Turning now to fatal accidents, in the first million hours there were four accidents in which a total of 114 passengers were killed. However, only two of these accidents involved large loss of life, whilst in the other two only one passenger was killed in each case.

In the second million hours there were also four fatal passenger accidents, but each accident unfortunately involved large loss of life, and 199 passengers were killed—nearly double that in the first million. Since the two million hours mark was passed, there has been a further fatal passenger accident, bringing the total number of fatal accidents to date to nine. This give a fatal accident rate of 0.41 per 100,000 hours.

ICAO figures show that during the five-year period 1956-60, the world-wide accident rate for scheduled services for all types of aircraft (including the jets from October 1958 onwards) varied from between 0.34 and 0.36 with the exception of 1959 when the figure was 0.29. Measured in this way, then, the jet fatality record so far is roughly 20 per cent worse than average. But this does not necessarily indicate that it is less safe to travel by jet. Safety can be expressed in a variety of ways, and as was mentioned in the previous article, each method has its own advantages and disadvantages. For instance, preliminary ICAO figures for 1960 show that the jets had 1.01 accidents per 100 million miles flown, while the comparable figures for turbo-props and piston-engined aircraft were 1.78 and 1.79. It is probable also that because of the higher productivity of the jets, the fatality rate per 100 million passenger miles is as good as that for propeller-driven aircraft.

It is likely that by the end of 1962 total jet flight time will have reached four million hours. Although this will be almost double the present jet total, jet flight time during 1962 is still unlikely to amount to more than 20 per cent of the flying time amassed on the world's scheduled services during the year.

Looked at in this light, total jet operating experience is still relatively small, and it must be hoped that, as experience grows, the jets will settle down to an accident record at least approaching that of the aircraft they have replaced, and that ultimately they will improve upon their predecessors.

ALAN E. SMITH

TABLE 1: JET FLYING HOURS
(Revenue and Non-revenue)
Estimated as at mid-December, 1961

Boeing 707	1,100,000
DC-8	570,000
Comet 4	260,000
Caravelle	240,000
Convair 880	85,000
	2,255,000

TABLE 2: JET AIRLINER TOTAL LOSSES

Date	Operator and Aircraft	Location	Circumstances	Fatalities Crw	Fatalities Pas.
15. 8.59	American Airlines Boeing 707	Grumman Field, Long Island	Crashed on approach during training flight	5	—
27. 8.59	Aerolineas Argentinas Comet 4	Nr Asuncion, Paraguay	Crashed several miles short of runway on approach	1	1
19.10.59	Braniff/Boeing Boeing 707	Nr Everett, Washington	Three engines torn off while on training and acceptance flight	4	—
19. 1.60	SAS Caravelle	Nr Ankara, Turkey	Struck hill on scheduled passenger service	7	35
20. 2.60	Aerolineas Argentinas Comet 4	Ezeiza, B.A.	Crashed on landing while on training exercise	—	—
23. 5.60	Delta Air Lines Convair 880	Atlanta	Crashed on take-off on training flight	4	—
16.12.60	United Air Lines DC-8	New York	Mid-air collision	7	76
19. 1.61	Aeronaves de Mexico DC-8	Idlewild, New York	Take-off accident	4	—
28. 1.61	American Airlines Boeing 707	Off Long Island	Crashed during training flight	6	—
		1,000,000 hr			
15. 2.61	Sabena Boeing 707	Brussels	Crashed near airfield after series of unusual manœuvres	11	61
24. 4.61	Japan Air Lines DC-8	Tokyo	Over-ran runway on landing. Constructive total loss	—	—
30. 5.61	KLM-VIASA DC-8	Nr Lisbon	Crashed into sea	14	48
11. 7.61	United Air Lines DC-8	Denver	Landing	—	16
27. 7.61	Air France Boeing 707	Hamburg	Swung on take-off and collided with building	—	—
12. 9.61	Air France Caravelle	Rabat	Crashed near airfield when preparing to land	6	72
28. 9.61	Varig Caravelle	Brasilia	Crashed on landing and caught fire	—	—
		2,000,000 hr			
23.11.61	Aerolineas Argentinas Comet 4	Campinas Airport	Crashed immediately after take-off	12	40
4.12.61	Lufthansa Boeing 720B	Nr Ebershein, W. Germany	Crashed on training flight	3	—
			Totals	84	349

At least two Antonov An-12s of Ghana Airways have been observed at Gatwick in recent weeks. Shown in these photographs is the rear gun turret, which is converted for civil operations. An-12s have been delivered also to the Indian Air Force. The engines are Ivchenko AI-20 turboprops each rated at 4,015 e.h.p.

AIR COMMERCE...

BOEING 727 PROGRESS FACTS

ALMOST exactly a year ago Boeing announced the first orders and a decision to go ahead with the 727. Today the production programme, according to Boeing, is on schedule. The first aircraft will be completed and will have flown by this time next year; and deliveries to Eastern and United (who have ordered 40 each) will begin late in 1963. According to a Boeing schedule published last January, the first 727 will be rolled out in August 1962 and flown in November 1962.

Four production 727s will take part in the flight test programme. One aircraft will be "instrumented" for confirmation of the ground structural test programme due to begin in November 1962. One 727 airframe will undergo static tests to 1.5 of the maximum loads expected in service; these tests will be to destruction, to enable Boeing to determine the airframe's growth potential.

The second airframe will be placed for fatigue-testing in a similar test rig and subjected to repeated loading to simulate the gust, manœuvre, landing and pressurization loads encountered in service. One hour of this testing will be equivalent to about eight hours of service; and these tests, beginning in April 1963, will extend for more than 16 months, to demonstrate a "life" of about 20 years' service. Boeing are not, apparently, doing their fatigue-testing in a water tank.

A full-scale operational 727 flying control system test rig is also now nearing completion, incorporating actual aircraft components wherever possible.

Parts for the first production 727s are now beginning to appear in the factory at Renton, and tooling is well advanced at the company's Wichita branch. Contracts worth £43¼m have been let to 500 sub-contractors and suppliers during the past year; this figure includes bought-out items—based on a batch of 100 production aircraft—such as integral passenger stairs, powerplant (including the P & W JT8D-1 turbofan engines), undercarriage, autopilot, and electrical and hydraulic systems. Contracts have been awarded for about 50 per cent of the structural items and 75 per cent of the equipment items.

The Boeing 727 order book now accounts for 117 aircraft, as follows: United, 40; Eastern, 40; American, 25; Lufthansa, 12.

CALEDONIAN CHARTER CHALLENGE

FOLLOWING the success of the Overseas Visitors' Club of London in securing New Zealand approval for one return flight per month on a charter basis between Auckland and London with Caledonian Airways DC-7Cs from next June, Mr C. Drezden (the club's joint secretary) has proposed a similar plan to the Australian Department of Civil Aviation. He was told, however, that any charter arrangements must be made with Qantas, and that fares must be 50 per cent of the existing first-class fares.

As the club's charters from New Zealand will include free overnight stopovers at Honolulu and New York (the US CAB rejected a third stopover at San Francisco), the club would need to charge much more for the Australia - London run than the NZ - London route. The club gives members a week's free bed-and-breakfast at its London hotels after arrival.

The Australian Department of Civil Aviation made its charter policy clear in a public statement of policy in December 1959. Chartering would not be allowed by airlines other than BOAC or Qantas, and only then to take up the slack in present schedules. The DCA is adamant that very cheap charter rates will not be permitted on international routes out of Australia. On no account would the Overseas Visitors' Club be permitted to give free extras to members on charters out of Australia, such as free overnight accommodation; and there would also be strict policing of baggage allowances, food, etc.

TEAL would get good business flying Australian members to and from Auckland to connect with the New Zealand charters. Whether Qantas will be allowed by the DCA to share in this business is anyone's guess: in 1960 the club made an approach to the DCA about running a charter between Luxembourg and Noumea (French New Caledonia), and the DCA made it clear they would not only make every effort to ban Qantas flying passengers to Noumea to connect, but would also try and stop TAI also.

The club has decided to drop any idea of making an official application for an Australia - London charter, but is considering other methods. The whole question is being seriously ventilated in the Australian press, for there is a feeling that the DCA is out of step with public opinion.

Meanwhile Mr Max Wilson, pioneer of cheap-rate fares between Britain and Commonwealth countries by the Overseas Visitors' Club in London (which he founded), is making another attempt to get into South Africa. This time it is under the name of Rooibok Air Charters (Pty) Ltd, whose application for a licence to operate charter flights to and from South Africa has been heard by the National Transport Commission in Pretoria. A decision has been "reserved." Return fares for tourists from Europe visiting South Africa would be between £100 and £110—or less than half the cheapest IATA fare.

Until now, Mr Wilson (who used Overseas Aviation as the operator) has had to fly through the "back door" into South Africa, as traffic rights into Johannesburg have been denied. He has used, instead, Lourenço Marques for flights from Britain and Luxembourg. Now that he has bought a controlling interest in Caledonian Airways, which has hired DC-7Cs from Sabena, he is dangling as a bait to South Africa the offer to pay £1,250,000 from Caledonian operations in other parts of the world into Rooibok's bank account in Johannesburg, either in dollars or sterling. This would help South Africa's balance of payments problems, which have been acute this year. The reward would be a charter licence for Caledonian into Johannesburg under the name of Rooibok Air Charters.

The Overseas Visitors' Club and a Johannesburg travel agency specializing in group tours have contracted to use two-thirds of the northbound flights if a licence is granted to Rooibok. South African Airways and Trek (which has leased SAA's surplus Constellations for its non-scheduled services to Europe) are said to be opposing the application.

GHANA'S STATUS SYMBOL

MANY airlines are primarily instruments of national prestige, but few of them ever have the honesty to admit it. Air France makes no bones about its Frenchness, as we noted in our review of the airline's annual report the week before last. But the remarkable statement just published by Ghana Airways surpasses all others for its candid chauvinism. The statement appears in *Ghana Airways News*, and the following are some extracts:

"Born three years ago, Ghana Airways is Osagyefo the President's own baby. It is also the pride of Ghana. And we are grateful to Osagyefo for the keen interest he has always shown in the activities and operations of the national airline . . .

"Ghana Airways has timely responded to the clarion call sounded by the Central Committee to the nation by forming a branch of

Mr H. R. O. Stephens has been appointed traffic manager of Skyways with effect from December 1. He will continue to represent Skyways at IATA conferences, which he did in his former job as the airline's IATA and interline manager

the indomitable Convention People's Party within the company.

"By this act the chairman, board, management and staff of Ghana Airways have chosen to close our ranks together in the march towards a Socialist Ghana.

"Ghana Airways is committed to flying high the National Flag and carrying aloft the spirit of African freedom, unity and solidarity to every corner of the globe. This obviously calls for hard work and the fact that we have got to double our efforts in fostering international contacts. In doing this let us not forget the importance of high standards . . ."

Another excerpt begins:—

"There are two kinds of airline operators—the commercial operator, and the national operator. Ghana Airways, however, is a national airline operator.

"This was stated by Mr James Mercer, chairman, Ghana Airways, at the inauguration of Ghana Airways branch of the Convention People's Party at the Accra Airport on Thursday, November 2, 1961. According to Mr Mercer, the commercial airline operator is the one who puts people on the plane, for instance, from Accra to Cairo, "without a meal and arrives in Cairo in six hours' time so that he can make profit by cutting out his meal."

"We in Ghana Airways," Mr Mercer stated, "are charged with the duty of carrying the National Flag to all parts of Africa and projecting the African Personality."

"Mr Mercer said there had been criticisms as to whether Ghana Airways was a revenue-making organization or not. Explaining this situation, he said that the time would come when certainly we would make a profit.

"The profit that a national airline makes," Mr Mercer continued, "is reflected in line with the prestige that the country gets in the number of people who come in and out easily, and the trade balance of the country in general."

Mr Mercer said he knew this was a delicate point, which could not be easily understood by even some of the most intelligent people. "But," he explained, "this is the policy initiated by Osagyefo Dr Kwame Nkrumah himself, and it is the policy that we follow—to bring closer to Ghana all independent African countries, and to show that the African when given the chance can be on his own."

HUGHES, TWA AND NORTHEAST

BEHIND the involved legal tussle in which the Hughes Tool Co's control of TWA and, through the Atlas Corp, of Northeast Airlines is being fought out lies the stark fact that Northeast's financial position is now desperate. On September 30 of this year it had a working-capital deficit of $10,391,916, a deficit net worth of $19,167,382, and it owed over $40m in longer-term debts. The position has since worsened and the carrier has been urging the CAB to grant permission for emergency funds from the Hughes Tool Co. This permission has now been granted by a three-to-two majority, but a decision has been deferred on the question of Hughes Tool obtaining complete control of Northeast.

The latter's long term debt includes $2m to a group of banks which financed its ten DC-6Bs, $8.6m to Vickers and Rolls-Royce for its Viscounts, $1.1m for Convair 880 spares, $0.5m to General Electric for lease of Convair 880 engines, $1.3m to Nelco, the leasing company through which the Convair 880s are rented up to November 15, $16.9m to the Atlas Corp which controls it and $9.8m to the Hughes Tool Co. The amounts owed are believed to have increased since September 30.

Northeast has told the CAB that if it withdrew from the East Coast - Florida routes "Eastern would be in a position of such dominance . . . as to preclude any effective competition"; for this reason the public interest would best be served if the Hughes Tool Co is allowed to give it interim emergency financing. Not surprisingly, this was contested by National and Eastern, the former asserting that Hughes Tool wants control of Northeast without strings attached. The president of TWA, Mr Charles C. Tillinghast, has now denied that his airline intends to seek financial assistance from Hughes Tool, its majority (but non-voting) shareholder, in spite of earlier statements that were interpreted to the contrary. TWA and Sud-Aviation have agreed to extend from December 17 "into 1962" the period in which financing of TWA's 20 Caravelles is arranged.

Mr Chester C. Davis, counsel for the Hughes Tool Co, has told the CAB that his clients are prepared to give Northeast emergency financial aid only if the Board allows them to acquire control of Northeast. "Anything we are seeking, if we are seeking anything," said Davis, "is the transfer of Atlas control to Hughes Tool Co." According to Davis, he and Raymond Cook, also an attorney for Hughes Tool, "have made every decision since this thing came up"; anyone who wants to question Howard Hughes, he said, should question them instead.

National and Eastern were basing their case on the argument that there is no legal way the CAB could permit the proposed financing. Eastern asserted that CAB members Gurney and Minetti may have been "sidelined" in their thinking which led them to vote in favour of granting the New York - Miami route to Northeast in 1956 by the then chairman of the Board who, said Eastern, was "dozing" during oral argument on the case.

If and when Hughes Tool regains control of TWA and has control of Northeast, said counsel for Hughes, the CAB will have to determine whether it would be in the public interest for the two to merge; if a merger was not approved, Hughes Tool would dispose of its interest in one of the airlines.

TWA's recent order for 20 Boeing 707-131Bs and six Boeing 707-331Bs has left the Hughes Tool Co with four Convair 880s and 13 Convair 990s on order, and the fate of these aircraft will obviously have to be settled soon. TWA has said it will not accept the 990s.

CUNARD EAGLE RETRENCHES

BOTH Cunard Eagle's European-based Viscount 707s are up for sale and the airline announces the suspension of plans to resume, next summer, the scheduled network of services from Manchester to Rimini, Pisa, Ostend and Bergen. As previously recorded, the independent cancelled its services from Manchester to Hamburg and Copenhagen last October.

The two Viscount 707s are being sold with full supporting spares, including engines and propellers. Meanwhile, efforts are still being made to dispose of the two Boeing 707-420s due to be delivered in March but which will be redundant. Operations of the two Bermuda-registered Viscount 755s between the Bahamas and Miami and Bermuda and New York continue unaffected.

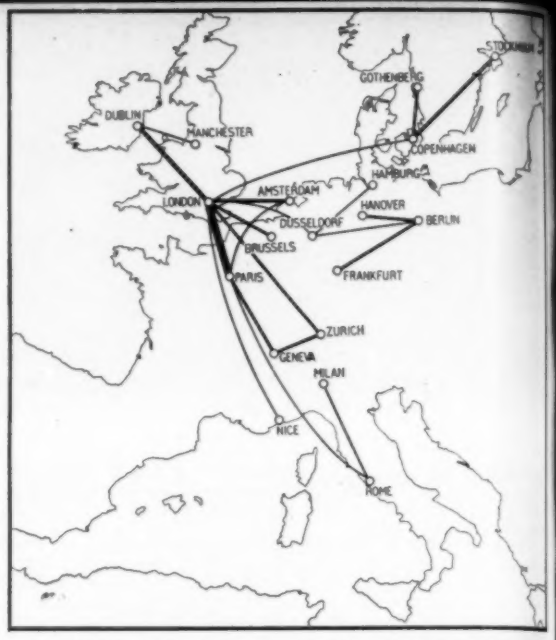
Explaining its decision not to operate from Manchester next summer, the airline says:

"Our policy during the last eight years has been to develop services from Manchester and we have repeatedly made application for sufficient scheduled services to provide adequate utilization to justify basing aircraft there. Our application for a viable pattern has never been successful.

"An example of this is the case of London - Manchester, for which we have applied three times. On making the application for the second time we demonstrated conclusively not only the public need for extra services but also the implications to us having regard to our Manchester policy. The Minister of Aviation at that time directed BEA to provide additional service and our application was rejected. We have experienced similar difficulties with routes such as Manchester - Nice.

"In view of this position we have reluctantly decided to suspend operations from Manchester in 1962. We hope to be able to re-integrate these services into our pattern in 1963 but much will depend on the outcome of the current appeal by BEA regarding the services for which we have recently obtained licences due for commencement in 1963."

Cunard Eagle's third application for London - Manchester was turned down recently by the ATLB.



This map, taken from Lord Douglas's recent lecture, shows the 20 leading European international routes in 1960. These 20 sectors carry one-third of all international passenger traffic in Europe. The BEA chairman's lecture was summarized in "Flight" for November 23 and 30

AIR COMMERCE...

APPEALS IN THE MILL

MR F. H. WILSON, chairman of Starways, told *Flight* last week that his company will appeal against the decisions of the ATLB to grant only one of its three applications for new services from Chester (Hawarden). The applications to serve Dublin and Belfast with DC-3s, DC-4s or Viscounts were refused, and although the service to the Isle of Man was granted, the requested summer frequency of ten per week was restricted to twice-weekly over a shorter season. It is understood that Starways do not consider that the Isle of Man route alone will justify the cost of setting up facilities at Chester (Hawarden).

Tradair, all of whose applications for nine scheduled inclusive-tour services from Southend to holiday places in Europe were refused (though they would have been granted had the company's financial resources been adequate), is understood to be considering an appeal to the Minister of Aviation for the licences to be held in abeyance for six months while the company is being reorganized. Tradair is at present in the hands of a receiver, Mr H. W. Agley, who is reported to have said that provided creditors are prepared to grant a moratorium of 12 months, and the company disposes of its two Viscount 707s, a profitable operation could be achieved a year from October 31. Esso Petroleum, which is owed £87,000 by Tradair, is said to have agreed to a moratorium.

It is believed also that Cunard Eagle is likely to appeal against the decisions of the ATLB in respect of its 16 applications for European and domestic services, seven of which were refused and the remainder granted on restricted-frequency terms. British United Airways has not yet decided whether to lodge an appeal.

SAFETY IN FOCUS

WITHOUT going into great detail, the latest edition of *Flight Safety Focus* passes on to its readers some information about the degree of lateral unbalance that can occur on a Boeing 707 before loss of adequate lateral control on landing.

Any significant lateral unbalance would probably result from the inability to jettison fuel equally from both wings for any reason—e.g., failure of a valve to open or of the jettison pipe to extend. Taking its text from Boeing flight test reports, *Focus* (published by the Flight Safety Committee at London Heathrow Airport) notes that a 707 was tested with the outboard main and reserve tanks on one side full and with the same tanks empty on the other side. This shifted the lateral c. of g. 51.8in from the aircraft centre line. Trim settings used were 5° of rudder and full aileron trim. The aircraft could be maintained in a wings-level attitude by use of the ailerons alone down to 144kt (about 6kt below initial buffet) with the flaps at 0°, and down to 120kt with the flaps at 30°. Control throughout all these tests was considered adequate.

Other subjects discussed in this latest *Focus* are pilot heart failure on approach, flag alarm shortcomings, engine failure at critical point on take-off, the dangers of burns from nylon clothing, and use of emergency exits during an escape from an inverted aircraft.

BREVITIES

A CAB examiner has recommended that BWIA be granted authority to operate between Antigua and New York until October 1, 1962.

Trans Caribbean Airways has ordered a second DC-8-50 for delivery next summer. The airline's first aircraft, delivered during the first week of last month, is in service between New York and San Juan and to Aruba and the Virgin Islands.

Channel Airways (East Anglian) has applied for a series of inclusive-tour flights from Southend using Viscounts, DC-4s or Carvairs. It is understood that the company has placed an order with Aviation Traders Ltd for one Carvair.

According to a New Zealand source a British Aircraft Corporation team has been discussing with TEAL replacement aircraft for the airline's three Electras, and with NZNAC a possible order for BAC One-Elevens to replace the airline's Viscounts.

The Irish Department of Transport and Power has published its report into the Alitalia DC-7C crash at Shannon on February 26, 1960. No defect, or even probable cause for the accident, is suggested. The aircraft lost height in a turn shortly after take-off.

A second edition of the Handbook of Aircraft Data has been published by International Aeradio Ltd of Hayes Road, Southall, Middlesex. Information is provided, in British and metric units, for 160 basic transport types and variants. Additional data on undercarriages has been included to assist those concerned with runway strength.

Yesterday, December 20, a two-day technical conference in Washington sponsored by the FAA and NASA on the problems of runway slush was due to end. The session was due to hear reports on Convair 880 tests conducted recently on 2,300 tons of crushed ice at the FAA National Aviation Facilities Experimental Center at Atlantic City.

An agreement to be signed between Braniff and Pan American will, subject to CAB approval, provide direct one-plane (707) services between Houston, Dallas and London and other points in Europe as from next spring. The Chicago sector will be operated as a Braniff flight with Braniff crews, and PanAm crews will operate the Chicago-European sectors.

By the end of next month Swissair should have four of its seven Convair 990s (of which two were originally intended for SAS), and will put them into service after route-proving flights on Middle East, Far East and South America routes early in March. FAA certification will be carried out in Switzerland. Meanwhile the two Convair 880Ms leased because of delayed 990 deliveries have been operating successfully on Middle and Far Eastern routes, and will be withdrawn when the 990s are in service.

On December 12 a BEA Rapide (G-AKZB) crashed on landing at St Just Airport after striking a post in poor visibility. There were no casualties. The aircraft was badly damaged.

Ghana Airways is to inaugurate an Il-18 service between Accra and Moscow on December 19 at a frequency of one flight per fortnight. The aircraft will call *en route* at Bamako (Mali), Tunis, Zurich and Prague.

BOAC and MEA have renewed their existing pool agreement on common routes between London and Beirut and London and the Gulf area. The extension is for 12 months and the two airlines express the hope that it will last for "many years."

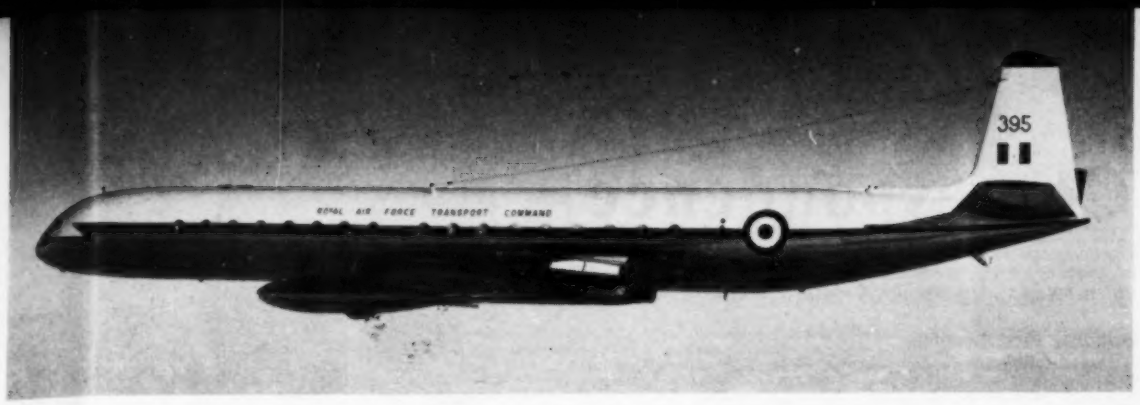
Birmingham Airport is considering reducing landing fees as a way to encourage the use of the airport for new services. The airport committee hopes during the first year of the scheme to base landing charges on the number of passengers carried as well as on the type of aircraft.

Channel Airways (East Anglian) announce a new coach-air service between London and the Channel Islands. The new service is a link-up of existing ones provided by Channel Airways from Portsmouth and by Southdown Motor Services from Victoria, London.

United Air Lines is using a "Rapistan" conveyor system at its new freight terminal at Los Angeles. Comprising 26 flow lines, it is said to cut freight loading and unloading time by a half. The system is produced by Rapids-Standard Co Inc of Grand Rapids, Michigan. The freight-operating technique was designed by E. C. Mitchell and Stuart R. Wallace of United Air Lines, Denver.

On December 18 TCA introduced DC-8s on to its services from Toronto to Nassau and Jamaica, supplementing the Super G schedules. TCA will inaugurate DC-8 services to Barbados and Trinidad on February 5 and to Bermuda on March 5. By the late winter of 1962, Antigua, to be served by Vanguards from February 2, will be the only one of TCA's southern destinations without jet service.

Mr Leon Balcer, Canadian Minister of Transport, opening TCA's new maintenance base in Vancouver recently, said: "It is my opinion that . . . the best interests of TCA and CPA will not be served . . . if they are competing with each other." This appears to be in conflict with Mr Balcer's decision last summer, objected to by the UK Government, to designate CPA on the Vancouver - London route. It is reported that the two Canadian carriers are now being urged by the government to "mesh" their international services.



One of the five D.H. Comet 4Cs due to enter RAF Transport Command service next year

SERVICE AVIATION

Army Flying News Air Force, Naval and

Final Salute

HAWKINGE closed down on December 8 as an RAF station when Marshal of the Royal Air Force Sir William F. Dickson, who was at one time station commander there and CO of 25 Sqn in 1935, took the salute when the Last Post was sounded and the RAF ensign lowered. The station was an RFC base in the First World War and in the second a Battle of Britain airfield.

"Victorious" Home

AFTER nearly one year's service east of Suez, HMS *Victorious* was returning to Portsmouth last Tuesday for Christmas leave. Since departing from England last January the carrier, commanded by Capt J. M. D Gray, has steamed 83,000 miles and spent 222 of her 333 days away at sea. For three months she stood by for the Kuwait emergency, steaming 30,000 miles in the extreme heat of a Persian Gulf summer; she has taken part in several SEATO and joint UK/US exercises in the Far East; and on her way home was diverted to Mombasa for Kenya flood relief work

Ocean Weather Ship

TODAY (December 21) the Under Secretary of State for Air, Mr W. J. Taylor, was to land by helicopter at Greenock docks to rename the RN frigate *Rushen Castle* as *Weather Surveyor*: she is to go to station "India" on December 27 to complete the weather ship fleet which provides meteorological information from the North Atlantic. These weather ships, whose positions are depicted in the map on this page, are converted RN corvettes and frigates of between 900 and 1,200 tons. Each one is responsible for an area of some 400 sq miles and while their primary duties are meteorological they also provide navigational aids and air-sea rescue services if necessary. Four of the ships (on stations B, C, D & E) are operated by the United States, the other five jointly by the United Kingdom, France, the Netherlands and Norway. Setting-up of the ocean weather ship service stemmed from an international conference held in London in 1946, following the growth of trans-Atlantic air traffic during the war and the need to provide on-the-spot weather information.

Commemorating 21 years of friendship between HMS "Heron" (RNAS Yeovilton) and the town of Yeovil, a silver heron is presented by the captain, Capt W. C. Simpson, to the mayor, Ald J. P. Kelly

Staff College Amenities

IN a ceremony marking the first occasion when the new dining-room and lecture hall at the RAF Staff College, Bracknell, had been put to use, the Chief of the Air Staff, Air Chief Marshal Sir Thomas Pike, unveiled a portrait of the Queen by Norman Hepple, RA, on Wednesday of last week. This was the first time this new painting had been seen publicly.

The lecture hall, like the dining-room, can seat 200. In addition to the portrait of the Queen it is to have on display a painting by John Yale of Treble-one Sqn in aerobatic posture. A feature of the dining-room décor is badges of all the RAF commands.

Kenya's Gratitude

"ABSOLUTELY magnificent," was the way in which the Governor of Kenya, Sir Patrick Renison, described the assistance given recently by the RAF in flood relief operations. Visiting RAF Eastleigh to meet 38 Group crews of Beverleys and Sycamores shortly before their return to the United Kingdom, Sir Patrick commented: "The work you have done here in Kenya has been one of the most exciting achievements in the whole of my service. Without you there is no doubt that thousands would have died. You have also taught people what friendship and help the Serviceman can give." Sir Patrick was accompanied by the AOC, Air Forces Middle East, AVM F. E. Rosier.

The 38 Group detachment of Beverleys of Nos 47 and 53 Sqns was flown out to Kenya to supplement the transport force based there. The Beverleys, each carrying a Sycamore helicopter, arrived at Nairobi on November 18 and food-dropping operations began as soon as the helicopters were unloaded. The Beverleys dropped a total of 1,600,000lb of food; the Sycamores (from 225 Sqn) made 185 sorties, landed 1,500lb of medical supplies and evacuated 21 people for medical attention. Air-to-ground relief operations are still continuing in Kenya, being carried out by Valettas of 223 Sqn, operating in the Juba River area on the Somali-Kenya border.

IN BRIEF

No 1 Air Navigation School has moved from Topcliffe to Stradishall.

The appointment of Gp Capt E. W. Tacon, CBE, DSO, MVO, DFC, AFC, as Commander, RAF Persian Gulf, was recently announced by Air Ministry.

Air Cdre H. Hawkins, CBE, AFC, ADS, Deputy Chief of Air Staff, Royal Rhodesian Air Force, has been appointed an Air ADC to the Queen.

A Chipmunk of No 1 Flying Training School which force-landed in a field near Malton, Yorkshire, was airlifted by Belvedere of 66 Sqn back to its base at Linton-on-Ouse on December 10.

Three RAF squadrons, Nos 24, 99, 114 and 511, were presented with plaques on behalf of the Ghana armed forces in London recently by the Ghana High Commissioner, Mr Kwesi Armah. They were being given "in grateful recognition of the support given by these transport squadrons during operations in the Congo." 36 Sqn, which was also involved, had previously been presented with a similar plaque in Accra.

Positions of the ocean weather stations which lie between America and Europe and are maintained by users of the Atlantic air routes —the United States, the United Kingdom, France, the Netherlands and Norway. See "Ocean Weather Ship" (above)

Correspondence

The Editor of "Flight" is not necessarily in agreement with the views expressed by correspondents in these columns. Names and addresses of writers, not for publication in detail, must in all cases accompany letters.

Britain's First Seaplane

I WOULD like to comment on the photograph and caption adjoining my recent letter (November 30) concerning the fiftieth anniversary of the first flight by a British seaplane.

Your predecessors were perfectly correct in describing the machine illustrated as *Water Hen*. This was the second aeroplane built for the Lakes Flying Co and followed *Water Bird* in April 1912. The latter was constructed by A. V. Roe & Co and the former at Borwicks, Bowness-on-Windermere.

Water Hen flew from April 30, 1912, until early 1916, when Asheton Sutton taxied it full tilt into a yacht; and during this time many RNAS pupil pilots gained their first flying experience on the machine.

I enclose some papers [a page from a brochure is reproduced above—Ed], one of which substantiates in part the statements made in my previous letter. Perhaps Roger Bacon would like to peruse them so that he can get his facts "straight and level."

Hounslow, Middx — H. F. COWLEY

"WATER HEN" FLYING OVER WINDERMERE.

THIS machine was entirely designed and constructed locally by the Lakes Flying Co., on Windermere, except only the engine, which is a French 50h.p. Gnome.

It flew satisfactorily on the first trial without any adjustment, and has required no adjustments, and very few repairs since.

It is easy of control, both on and off the water, comfortable and popular with passengers, and well-adapted for learners.

One of the pages from a brochure, "Waterplanes or Hydroaeroplanes," published by The Lakes Flying Co, Cockshott, Windermere, and sent by Mr Cowley with his letter in col 1

Pilots and Money

I WAS sorry to see (December 7 issue, page 893) that there is such a discrepancy between the Independents' and the Corporations' rates of pay. But it occurs to me that the situation might be better if there were no negotiated agreements whatsoever in relation to the Independents—having regard to Section 15 of the Civil Aviation Act 1949, two paragraphs of which are quoted below:—

"15 (1) The provisions of this section shall have effect for the purpose of securing that the terms and conditions of employment of persons employed by any independent undertaking constituted for the purpose of providing air transport services or of carrying out other forms of aerial work shall, except in so far as those terms and conditions

(*a*) are regulated by or under any enactment other than this section; (*b*) are in accordance with an agreement for the time being in force between the undertaking and organizations representative of the persons employed; or (*c*) are in accordance with any decision for the time being in force of a joint industrial council representing the undertaking and organizations representative of the persons employed; comply with the following requirement, that is to say, that *they shall not be less favourable than the terms and conditions observed by the Airways Corporations in the case of persons engaged in comparable work* [my italics), or, where the Airways Corporations do not observe the same terms and conditions for persons engaged in comparable work, are not less favourable than the terms and conditions observed for such persons by at least one of those Corporations.

"(2) If any dispute arises as to whether the terms and conditions of any person's employment ought to comply with the requirement aforesaid, or as to what terms and conditions ought to be observed for the purpose of complying therewith, the dispute shall, if not otherwise disposed of, be referred by the Minister to the Industrial Court for settlement."

Richmond, Surrey — H. CAPLAN

Air Bus Makes Money

THERE seems to be some understandable confusion (*Flight*, November 9, p 747) between Eastern Air Lines' "Air Bus" and "Air Shuttle" operations. This no doubt stems from the fact that both services are provided generally by identical and interchangeable equipment—Super and Super-C Constellations, which until recently bore the legend "Fly Eastern Air Bus" on their sides. (They now say simply "Fly Eastern Air Lines.")

To explain the differences, in summary: "Air Bus" requires advance payment and ticketing; has restrictions on refunds; operates on relatively infrequent schedules; has fixed capacity, and is primarily designed to attract vacationists. "Air Shuttle," on the other hand, has no advance reservations, although tickets may be purchased before flight as well as paid for on board; operates on very frequent weekday schedules (hourly 7 a.m. to 10 p.m.); has unlimited capacity (we carried over 7,500 passengers on 103 flights on Sunday, November 26, operating our 10 p.m. New York-Boston flight in seven sections in order to carry students and others returning from the Thanksgiving Holiday weekend); and is normally patronized chiefly by business commuters.

"Air Shuttle," by the way, has now carried more than 400,000 passengers since it began operations on April 30 this year, and has maintained an exactly-on-time departure record of 96.6 per cent—unheard of in the industry.

We were amused by your reference to the "publicity boys." May I reassure you, as the one who was on hand when we operated the famous first "Air Shuttle" flight for one passenger, that this was not a contrivance! It happened in the normal course, and we took what advantage of it we could. As it happened, we did not even have our photographer on hand, having just sent him back to his studio to develop other pictures he had been making at the airport.

New York 20, NY — EUGENE DU BOIS, Eastern Air Lines Inc

Supersonic Rat-race?

I WOULD like to point out to Phugoid (Correspondence, November 23) that we are not all sissies. I rather enjoy supersonic bangs and I see no reason why progress should be halted for the sake of a few nerve cases. For Heaven's sake let us have some pioneer spirit in aviation; it should not all be submerged in economics.

Also remember, a plane that can cut turn-around time in half can cut its payload in half, doubling the safety factor for any given passenger.

Don't publish the letters of grey-minded miseries. British aviation has been let down by too much dead wood at the top.

Ross-on-Wye, Herefordshire — G. TAYLOR

Bringing Back Boomerangs

DUE, one can only assume, to the current popularity of one of the top pops in which Mr Charlie Drake bemoans his inability to make his boomerang come back, the writer has had an unusual number recently of requests for references to the theory of boomerangs. Even Australia House was in the queue.

By a happy chance the famous File of Abstruse References which has been collected over the years contains an item or two which may be of interest to the *Flight* reader.

The earliest reference is in the Philosophical Transactions (A) of the Royal Society for 1890 (Volume CXC, pages 23-41). This is by G. T. Walker. The omniscient Lanchester has a considerable article in his Volume II (Aerodonetics). Appendix VIIIB deals at length with the weapons. A book entitled *Treatise on Gyrostatics and Rotational Motion* by Gray was originally published in 1918 but was re-published as a paperback by Dover Publications of New York in 1959 and this contains some good stuff on the subject. Constables are Dover agents in this country.

The French journal *L'Aeronautique* for September 1933 contains *Du Boomerang a l'Autogire*, which sounds an interesting development. Finally, a reference which I seem to have acquired without actually seeing the relevant book is *Theorie, fabrication et lancement de boomerangs* by Turck, published in Paris by Chieron. This sounds as though it might be the best of the lot.

London W1 — FRANK SMITH

R/T Phraseology Amendments

I SHOULD like to point out to "Co-pilot" (Correspondence, November 30) that "Roger Dodger" may also be construed as *I watch Huckleberry Hound* (sorry, *Ho-o-o-o-ound*).

Newbury, Berks — YOGI BEAR

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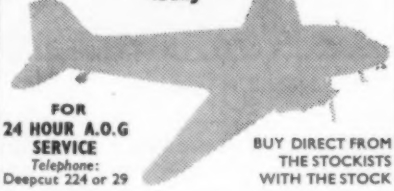

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